INSIDE DOPE

Learn to live and laugh—
Thus delay your epitaph

By GEORGE F. TAUBENECK

Stories of the Week
'Compressed Christianity'
The Score on Westinghouse

Stories of the Week

Next to the nonpareil Bishop Fulton J. Sheen, orator S. Parkes Cadman probably is the most spellbinding Propagator of the Faith radio-listeners have heard in our generation.

Fondly Protestant preacher Cadman related a bedtime fairy tale to his granddaughter.

"Grampaw," she challenged when he concluded, "was that story true, or were you preachin'?"

Washington correspondent Harold Hinton (*New York Times*) laboriously wrote a biography of Cordell Hull, who was Secretary of State under FDR.

Upon reading the manuscript Hull made only one correction.

Hinton revealed that Hull had returned from the Spanish-American war with quite a wad of money. He had "cleaned out his company at poker," Harold footnoted.

For "company" Hull substituted "regiment."

'Compressed Christianity'

In Tecumseh, Mich. (home of Tecumseh Products) a remarkable young minister serves the First Presbyterian Church. The Rev. George Walworth not only is a handsome chap, who is loaded with personality, but he has a refreshing outlook on life in the sermons he delivers. Herewith one of his unique messages:

"Tecumseh has been called the 'compressor capitol' of the world. As such, the residents of this community should understand the compressor in a most unique manner. For spiritual consideration therefore, compressed Christianity would introduce the relation between faith and works!

"The compressor's main task in refrigeration is to exert such pressure that vapor can be returned to its original liquid form. In this simple operation, by compressing vapor to liquid and liquid to vapor, heat can be expelled and absorbed to produce the essential basis for refrigeration.

"Scientifically speaking there is no such thing as 'cold.' The only way it can be defined is in a rather negative way, or by saying 'cold' is simply the lack of heat. Things cannot be made cold directly. Heat can be removed.

"By the same measure, in Christian reference, faith without works is dead! 'Compressed Christianity' deals with this profound point. 'Cold' believers are not the normal form of faith. Heat or warmth produces growth, but cold faith (faith that is not working) is latent, lethargic, and static.

"Refrigeration compressors were developed out of an urgent need to remove heat from where it was not wanted. 'Compressed Christianity' is also the result of an unprecedented need. The Christian's need is more than just preserving faith. It is that of actually compressing and condensing it in a more formidable capacity! It means that concentration of the essential points of our faith to enable the transfer of spirit to concrete action.

" 'Compressed Christianity' stands boldly in the midst of wavering cold-hearts. In this process, acts of faith, as they are culminated in God's will, can be used over and over for the fortification and development of our souls.

(Concluded on Page 9, Col. 1)

AIR CONDITIONING & REFRIGERATION NEWS
THE NEWSPAPER OF THE INDU... BY ...

Reentered as second-class matter October 3, 1936 at the post office at Detro... of March 3, 1879.

Prices Drop as Excise Ta... ...ced 5%; Await Rulings on Refu... ... Floor Stock

Several Companies Announce Price Cuts

WASHINGTON, D. C.—Reduction in Federal excise tax from 10% to 5% became effective noon April 1 with the passage and signing of H. R. 8224, the excise tax bill.

Refunds of the 5% difference between the new and old tax rate on floor stocks as of April 1 are specifically provided for manufacturers, wholesalers, and retailers in the Douglas-Capehart amendment adopted at the last minute.

Refrigerators, home freezers, and dehumidifiers benefit from the tax cut. Air conditioners do not.

The tax cut also applies to ranges, stoves, clothes dryers and ironers, water heaters, fans, flat irons, space heaters, electric blankets, spreads, sheets, and garbage disposal units, dishwashers, toasters, broilers, mixers, juicers, food choppers, floor polishers, waxers, electric door chimes, and some other items.

Tax reduction does not apply to radios, television sets, phonographs, or records.

It is expected that the tax reductions will be passed along to

(Concluded on Back Page, Col. 2)

Amana Names Moore Engineering Director

AMANA, Iowa—Appointment of Robert E. Moore as director of engineering for Amana Refrigeration, Inc., was announced recently by George C. Foerstner, executive vice president.

R. E. Moore

In this capacity, Moore will direct design of the freezers and room air conditioners being made by the company. Before this, the new director of engineering was Amana's chief freezer cabinet engineer. He has been with the company four years.

Before joining Amana, Moore

(Concluded on Page 4, Col. 4)

Alaska Sets Pace for Room Cooler Sales

CHICAGO — Admiral Corp. claims that it sold more room air conditioners in Alaska than in San Diego, Calif. and Jacksonville, Fla. during the first three months of 1954.

According to Clarency Tay, general manager of branches, the latest order this week from William W. Winkels, general manager of Admiral Distributors, Inc., Alaska Div., put the territory ahead of both Jacksonville and San Diego in unit sales thus far this year.

"Some of the air conditioners

(Concluded on Page 29, Col. 1)

Text of Floor Stock Refund Amendment

"(A) In general: Where before April 1, 1954, any article subject to the tax imposed by Section 3405 (A), Section 3405 (B), or Section 3406 (A) (3) has been sold by the manufacturer, producer, or importer, and is held on such date by a dealer and has not been used and is intended for sale, there shall be credited or refunded (without interest) to the manufacturer, producer, or importer an amount equal to one-half the tax paid by such manufacturer, producer, or importer, on his sale of the article, if such manufacturer, producer, or importer—

"(1) Has paid such amount as reimbursement to the dealer who held such article on April 1, 1954; and

"(2) Files claim for such credit or refund before Aug. 1, 1954.

"(B) Definition of dealer: As used in this section, the term 'dealer' includes a wholesaler, jobber, distributor, or retailer. For the purposes of this section, an article shall be considered as 'held by a dealer' if title thereto has passed to such dealer (whether or not delivery to him has been made), and if for purposes of consumption title to such article or possession thereof has not at any time been transferred to any person other than a dealer.

"(C) Limitation on eligibility: No person shall be entitled to credit or refund under this section unless he has in his possession such evidence of the inventories with respect to which he has made the reimbursements described in subsection (Q) as may be required by regulations prescribed under this section.

"(D) Penalties and administrative procedures: All provisions of law, including penalties, applicable in respect of the taxes imposed under Section 3405 (A), 3405 (B), and 3406 (A) (3) shall, in so far as applicable and not inconsistent with this section, be applicable in respect of the credits and refunds provided for in this section."

Fogel Designs New Ice Cube Makers

PHILADELPHIA—Development of a new ice cube maker designed to align with underbar fixtures has been announced by Fogel Refrigerator Co. here.

The unit is available in two 24-tray models (3 MCI and 2 MCI) and a smaller model (16 MCI).

The "Rapid Freeze" model 3 MCI freezes 48 lbs. (384 cubes) every three hours, according to the company.

"The cubes, made in 24 quick-release trays, can then be transferred to the storage compartment while a new batch is being frozen," it was explained. "This storage compartment is kept separate from the cube-freezing area so that a supply of cubes can be removed

(Concluded on Back Page, Col. 4)

New Law Calls for Refunds to Dealers

DETROIT, April 1 — Although the new excise tax law makes specific provision for refunds on floor stocks of appliances, as shown in the accompanying text of the Douglas-Capehart amendment, mechanics and procedure for such refunds have not been worked out at this writing. Administrative rulings covering the many points involved will have to be issued by the Internal Revenue Service.

In the meantime, prices have been reduced on appliances, effective in most cases as of April 1. It is assumed that dealers who sell from their present stocks, on which the 10% tax had been paid, will receive a refund because of the new sale price at a future time.

(Concluded on Back Page, Col. 2)

Copeland Auto A.C. Unit Has Wide Range

SIDNEY, Ohio—A new, high-speed compressor for automotive or other applications is being built by Copeland Refrigeration Corp.

"It is belt-driven and has a wide range of capacities," the company said. "The compressor can be operated from ½ hp. to 3 hp., so it is very flexible.

"There is a forced-feed lubrication system that operates efficiently with the shaft turning in either direction. It has solid bronze rods and main bearings.

(Concluded on Page 29, Col. 5)

For Facts, Figures, Photos Of New Westinghouse Appliance Plant

See pages 26, 27

Radiant Condenser In Manitowoc Freezers

MANITOWOC, Wis.—Two upright freezers that take up a space of only 30 by 36 in. comprise the 1954 Manitowoc freezer line, the Manitowoc Equipment Works announced recently.

They are an 18½-cu. ft. model priced at $579.95 and a 14-cu. ft. model with a suggested list price of $489.95.

The 18½-cu. ft. unit stands 67¾ in. high and the 14-cu. ft. model 56⅜ in. tall.

A radiant condenser at the back of the unit is introduced with these models, Manitowoc said. It cuts down operation noise and eliminates cleaning, the company added.

New brass nameplate, escutcheon, and plastic covered hinges grace the exterior of the unit, while "Frost-Mint" color marks

(Concluded on Page 4, Col. 2)

Frigidaire Cuts Prices $20-40 On Room Units

⅓ Hp. Unit Unchanged; Dealers Protected from Losses on Inventories

DAYTON — Price cuts ranging from $20 to $40 on ½, ¾, and 1-hp. room air conditioners have been announced to dealers by Frigidaire Div., General Motors Corp.

Price of the company's ⅓-hp. conditioner remains unchanged at $229.95.

"To help place dealers in all cities across the country on an equal basis, freight on all models will be prepaid as is now done on Frigidaire's appliance products," the company also announced.

Under the company's price protection plan, dealers are being rebated for inventories of current models.

New suggested cash prices are as follows: ½-hp. model, reduced from $319.95 to $299.95; ¾-hp. model, from $389.95 to $359.95; 1-hp. model, from $459.95 to $419.95.

Price reductions were announced at a series of meetings Frigidaire is conducting for its district organization sales managers to form plans and programs for an intensive air conditioning sales drive.

(Concluded on Page 29, Col. 3)

Armstrong Shows 6 New Air Conditioners

COLUMBUS, Ohio—Introduction of six new models of summer air conditioners has been announced by Armstrong Furnace Co., with plants here and in Des Moines, Iowa.

Four of the new units in the expanded line are designed for home cooling, to be used in conjunction with "any good warm-air furnace." Two of these are called "Companion" units by the maker because they harmonize in appearance with Armstrong upright winter air conditioning furnaces.

Two are called "Duct Coolers" because they are built to be installed directly in the warm-air ducts which serve the furnace.

The Duct Coolers, actually horizontal models, are particularly well adapted for use with horizontal and counterflow furnaces, although they can be used with any type furnace equipped with a blower, according to Larry Hickok, Armstrong executive vice president.

The Companion models have self-contained blowers. A completely automatic plenum damper, which directs airflow through the summer air conditioner when it is in operation and changes it to the furnace when that unit runs, is also standard equipment with this model.

Both types are made in 2 and 3-ton sizes, as is the "Package Unit," designed to cool large open areas,

(Concluded on Page 4, Col. 5)

IN THIS ISSUE

Wichita Appliance Dealers Association Plans Clinic April 14 for 500 Members

WICHITA, Kan. — More than 500 Kansas dealers will meet to study methods of improving their business operations at the second annual Appliance Dealers Clinic sponsored by the Wichita Appliance Dealers Association, Inc., April 14 at the Broadview hotel.

Ten topics of interest to appliance-television retailers have been selected as subjects for discussion by the industry leaders who make up the program. Program details as announced are as follows:

9 a.m., registration. 10 a.m., Welcome, Emerson Dole, WADA president. 10:10 a.m., "Appliance Credit & Financing," Walter Y. Rahn, Commercial Credit Co. 10:40 a.m., "Business Controls," Wallace Johnston, Wallace Johnston Appliances, Inc., Memphis, Tenn. 11:30 a.m., "Advertising — National & Local," K. G. Gillespie, Jenkins Music Co., Kansas City, Mo.

12 noon, Luncheon. 1:30 p.m., "Selling Techniques," Carroll Willis, Siebert & Willis, Inc., Wichita. 2:20 p.m., "Our Manufacturers," Vergal Bourland, Vergal Bourland Home appliances, Fort Worth, Texas. 3 p.m., "Our Customers," Al Robertson, Westinghouse Appliance Stores, Oklahoma City, Okla. (NARDA Director). 3:20 p.m., "Television & The Appliance Business," Mort Farr, Upper Darby, Pa. 4:15 p.m., "When We Work Together," A. W. Bernsohn, Chicago, (NARDA managing director). 4:30 p.m., "Our Collective Thinking," Emerson Dole.

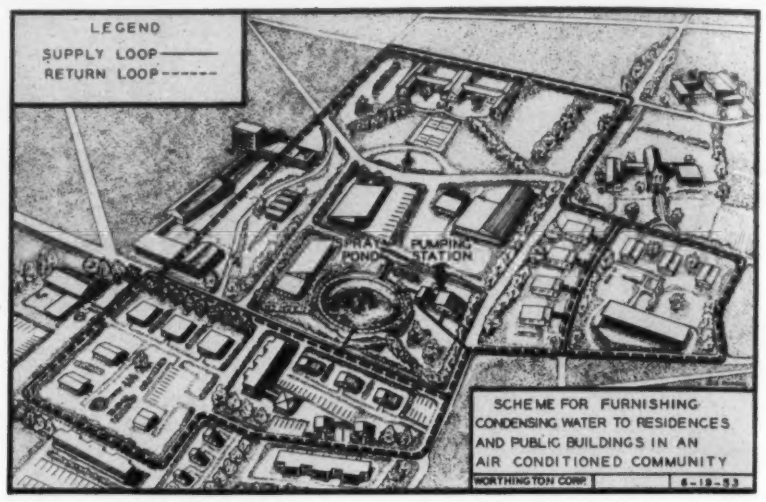
5 p.m., Fellowship hour. 6:30 p.m., banquet. Master of ceremonies, J. A. Broadhurst, The Appliance Center, Wichita. Banquet speaker, H. B. Price, Jr., Price's, Inc., Norfolk, Va., "You—Mr. Appliance Dealer."

An executive committee meeting of the National Appliance and Radio-TV Dealers Association has been called for April 13 in Wichita, in tribute to the Wichita Appliance Dealers Association, Inc.

San Francisco; Las Vegas Contractors Join RACCA

CLEVELAND — Refrigeration contractors associations in San Francisco and Las Vegas, Nev. have moved to join the national Refrigeration and Air Conditioning Contractors Association, W. Ray Kromer, executive vice president, announced recently.

The Las Vegas group is a new local that has just elected officers, established a dues structure, and appointed committee chairmen, Kromer said.



SCHEMATIC DRAWING shows how spray pond and pumping station can be incorporated in pre-planned communities which include air conditioned homes.

How Water Re-Use Can Be Incorporated In New Air Conditioned Communities

HARRISON, N. J.—At a recent meeting of water works officials from several New Jersey municipalities and Worthington Corp. air conditioning experts, plans were discussed for alleviating water shortages in expanding communities.

In some New Jersey areas, as well as in other parts of the country, seasonal droughts have presented an acute problem in water conservation, particularly where air conditioning of private homes is involved.

Worthington's vice president in charge of air conditioning, M. M. Lawler, stated that while air conditioning equipment manufacturers are working to develop practical, low-cost water conservation devices for residential units in existing developed areas, a scheme has been devised that may fit the particular situations faced by architects and builders of large residential developments in some localities.

This scheme involves the use of a spray pond, centrally located in a recreational park area and made attractive with suitable architectural or landscaping treatment. The water could be treated to inhibit corrosion and the system could be drained during the winter months.

During the hottest weather, it is estimated that only one tenth of the water normally required for air conditioners utilizing water-cooled condensers would have to be purchased from the local water departments. This is about as much as each residence uses for sanitary purposes.

In offering this plan, Lawler explained that in an average new housing development located several miles from the city supplying the water, the average family of four can be expected to use 3,000 to 4,000 cu. ft. of water in a quarter, exclusive of air conditioning.

When the family uses a three-ton air conditioner operated with a water-cooled condenser consuming 1½ gals. per minute of cooling water per ton, in the July-September quarter they will require an additional 35,000 to 45,000 cu. ft. of water. The water supply facilities would, therefore, have to be 10 to 12 times as large if all the homes are air conditioned. This great capacity would be required only during the hottest months during drought conditions.

Rather than have the nearest municipality furnish all the water, the architect and the builder could design and install their own recirculating water system, placing the piping under the streets along with the sanitary water supply piping. At some central point, designed as a recreation area, a pumping station and a large cooling tower or the spray pond could be constructed.

Quite feasibly, Lawler concluded, the spray pond area could be designed for ice skating in the winter by the far-sighted architect or builder who wants to add another sales feature to his new development.

Western Union Offers Weather Forecasting As Aid to Business

DETROIT—Newest entrant in the field of specialized weather forecasting for businessmen is Western Union.

The telegraph company is acting as sales agent for the private weather forecasting services of the National Weather Institute of Los Angeles, and now offers forecasts for any part of the United States for periods from one to six months in advance.

Subscribers may obtain forecasts for particular geographical areas dealing with specific weather factors affecting their business. Short-range forecasts, seven days in advance of the weather, are telegraphed to clients. Sudden developments of critical or emergency weather conditions are also wired.

The company pointed out that as a result of notable advances made in weather forecasting science, "trained meteorologists today can forecast weather with about 85% accuracy.

"This accuracy means predictability. And predictability can be turned into extra profits when advance weather reports, pinpointed for specific sales areas, are meshed with sales plans."

Residential Cooling Topic For ASHVE Summer Meeting

SWAMPSCOTT, Mass.—Operating costs of residential cooling, solar radiation, air filtration, relation of room size and panel area, and vertical jets for hot and cold air are among the topics of technical papers scheduled for the 60th semiannual meeting of the American Society of Heating and Ventilating Engineers at New Ocean House here June 28 to 30.

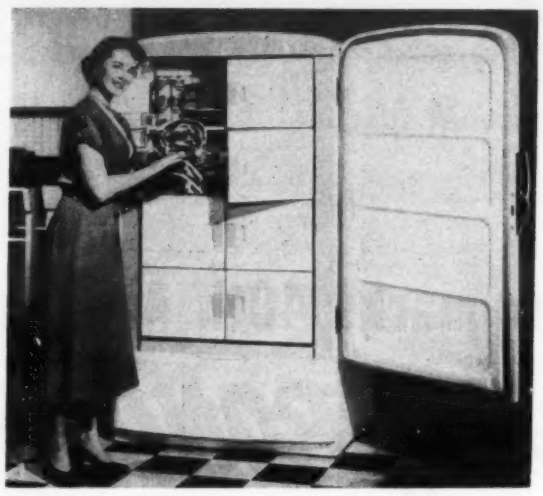
R. T. Kern is general chairman and A. L. Hare vice chairman of the committee on arrangements. Dean Lauren E. Seeley is honorary chairman.

Schedule of technical papers has been arranged by Prof. B. H. Spurlock, Jr., chairman of the program and papers committee.

Rehard Joins Thermalair

DETROIT—Affiliation of J. C. Rehard with Thermalair Engineering Co. here has been announced by Emanuel Feinberg, president of the firm.

Rehard, a registered professional engineer in the states of Michigan and Ohio, was formerly chief safety engineer of the City of Detroit. Previously he had been assistant chief and at one time had been a field inspector for this city department. Industry experience preceded Rehard's city posts.



MANITOWOC upright freezer featuring inner double doors for each compartment to protect interior from frost-forming warm air.

Manitowoc Freezer Has Radiant Condenser--

(Concluded from Page 1, Col. 4)

the interior, door pulls, breaker strip, and gasket.

Both models feature inner double doors for each compartment to protect the interior from frost-forming warm air. Cold wall construction with coils in all five interior surfaces is employed. No coils are used in the shelves, thus keeping the shelves frost-free. Frost forms only on side walls. During defrosting, it loosens quickly and slides down the smooth walls to the bottom shelf where it can be easily sponged up.

The company claims that the cold wall design provides about 50% more refrigerated surface than cold shelf design and keeps temperatures inside the box within a 5° F. range.

A quick-freeze switch on the instrument panel will drop the temperature of the entire unit to -20° F. without disturbing the thermostat setting. For contact freezing, packages can be placed on the bottom shelf next to the freezing coils.

A warning light burns continuously. It goes off to warn of power failure or rising temperatures within the freezer. Both models are equipped with car-type locks to keep children from accidentally opening the freezer. A 20-watt heater wire inside the breaker strip controls outside "sweating."

Both models use a ¼-hp. hermetically sealed compressor that operates on 110-120 volts, 50/60 cycle a.c. "Freon-22" is the refrigerant.

The 18½-cu. ft. model has interior dimensions of 46½ in. high, 29 in. wide, and 23⅜ in. deep. It holds more than 650 lbs. of food. Net weight is 430 lbs. and shipping weight 510 lbs.

The 14-cu. ft. model has the same interior width and depth dimensions but it's 35⅛ in. high. Holding more than 490 lbs. of food, it has a net weight of 384 lbs. and a crated weight of 444 lbs.

Amana Names Moore--

(Concluded from Page 1, Col. 2)

served in various engineering capacities for North American Aviation, Inc., General Electric Co., and the Glenn L. Martin Co.

The new engineering director holds 20 patents in the fields of refrigeration and electronics and is co-author of the book, "Materials and Processes in the Electrical Industry." He led design of the Stor-mor door, feature of Amana's 1954 freezers.

Norge Distributes Dealer Ad Materials

CHICAGO — Norge distributor salesmen are now equipped with latest factory advertising materials to help dealers prepare 1954 newspaper campaigns, the division announced recently.

Some 209 newspaper advertising mats and 127 product illustrations are among the factory materials for dealers, according to John D. Schuman, Norge advertising manager.

The materials are in a file folder envelope, with mat proofs for each product in a separate tabbed folder for easy accessibility.

Color photos of 1954 store display materials have been supplied, including entirely new materials created for Norge's 30-in. gas and electric ranges and "Customatic" refrigerator-freezer combinations.

Amana Will Again Sponsor 'People Are Funny' Show

AMANA, Iowa—Amana Refrigeration, Inc., manufacturer of home freezers and room air conditioners, will sponsor "People Are Funny," starring Art Linkletter, on the entire CBS radio network, starting April 10, it was announced recently.

The half-hour program, originating in Hollywood at 8 p.m. (EST) each Tuesday night, will be carried by 205 CBS stations, one of the largest networks ever assembled, it was reported by George C. Foerstner, Amana's executive vice president.

"Amana is undertaking sponsorship of the program again because of the excellent results obtained with consumers and dealers when the company sponsored the show last summer," Foerstner said.

An extensive package of promotional and merchandising materials will be made available to dealers to help them capitalize on the "People Are Funny" Linkletter program.

Warner Retires as Crosley Director of Purchases

CINCINNATI — Frank Warner, director of purchases at the Crosley Div., Avco Mfg. Corp., for some 10 years, has announced his retirement.

Warner said he plans to make his home at North Miami Beach, Fla. and "just fish."

ARMSTRONG summer air conditioner (on the left) installed with automatic changeover damper and Armstrong "Indoor Sunshine" winter air conditioner.

Armstrong Line--

(Concluded from Page 1, Col. 5)

such as storerooms and offices, without ducts.

"This model has a powerful, rubber-mounted blower to deliver cooled air over a large area," the company said. "Its air outlet grille has both horizontal and vertical vanes, each of which can be individually set to distribute air volume forward, up, down, right, and left in exactly the desired proportions."

The refrigerant circuit in all models is hermetically sealed. Armstrong has put a flat five-year guaranty on this circuit.

"If an Armstrong unit should fail, the dealer simply disconnects water and power lines, slides the unit out of the cabinet, slides in a replacement unit, and returns the old one," Hickok said. "He installs a newly-sold air conditioner just as easily."

Last year, the company marketed two air conditioner models in the same sizes as this year's units—2 and 3 tons.

Augusta, Ga. Will Vote on Cooling Bell Auditorium

AUGUSTA, Ga.—Augusta voters will go to the polls on Tuesday, April 13, to decide whether or not they approve issuance of bonds in the amount of $80,000 to finance air conditioning of Bell Auditorium.

The municipal auditorium was erected approximately 13 years ago at a cost of only $240,000 to the citizens of Augusta, but today it is valued at $2,000,000.

At present, however, the auditorium is a liability during five months of the year, according to Auditorium Manager J. F. Redingfield, because groups suspend operations rather than use the uncooled building during the warm and hot months.

The five commissioners charged with operation and maintenance of the huge building cite numerous records to prove that air conditioning of the structure would insure additional revenue annually to finance several major permanent auditorium improvements for the ultimate benefit of the public.

At present, use of the auditorium proper rules out simultaneous use of the music hall and vice versa.

Auditorium commissioners have emphasized the fact that air conditioning ducts were provided in the original building plans, only the actual cooling equipment is needed.

Jacksonville Distributor Occupies New Quarters

JACKSONVILLE, Fla.—Empire State Distributors, Inc., distributor of Philco products in the Jacksonville area, recently occupied its spacious new office and warehouse building at 1555 Marshall St.

E. K. Rudolph, general manager of the firm, said air conditioning equipment is represented in the new Philco line by room models as well as 2, 3, 5, and 8-ton units.

The Empire firm is headed by Sam Green as president. Walt Markert is sales manager.

HOUSEHOLD REFRIGERATION

Frigidaire Appoints Smith, Anderson, Hatfield to Appliance Sales Posts

DAYTON—Heading a series of promotions to Frigidaire appliance sales posts, R. H. Smith, formerly a zone sales manager, has been named sales manager of laundry equipment, according to H. F. Lehman, general sales manager of Frigidaire Div., General Motors Corp.

W. H. Anderson

Richard H. Smith

Roy L. Hatfield

Smith has served as manager of appliance research; appliance sales manager of the eastern region in New York City; and appliance zone sales manager for the factory in Dayton.

He succeeds J. R. Cobb, who is heading up rural sales in the major dealer division of the appliance sales department. Cobb joined Frigidaire in 1948.

Roy L. Hatfield, formerly a zone sales manager of appliance sales, has been appointed general sales manager of the Birmingham branch, Frigidaire Sales Corp.

Hatfield, who has been associated with Frigidaire since 1940, served as advertising and sales promotion manager of the Frigidaire organization in Nashville and appliance sales manager of the southeastern region, prior to coming to Dayton as zone sales manager last year.

W. H. Anderson, appliance zone sales manager for the factory in Dayton, has been appointed appliance sales manager of the Los Angeles branch, Frigidaire Sales Corp. He joined Frigidaire in 1947 as supervisor of visual training, sales promotion department, and in 1952 became appliance sales manager of the central region. In 1953 he was named zone sales manager, a position which he held until his new appointment.

D. R. Prugh, formerly manager of appliance marketing research division, replaces Smith as zone sales manager. Prugh has been with Frigidaire over 16 years. Prior to his new appointment, he was manager of commercial marketing and manager of appliance market research.

Replacing Hatfield as appliance zone sales manager is C. I. White, formerly associated with the major dealer division. White joined Frigidaire in 1926 and has been active in the major dealer division of appliance sales during his long career with the company.

Anderson is being succeeded by Ralph A. Blakelock, formerly commercial zone manager.

E. J. Hawkes, of the commercial marketing division, has replaced Prugh as manager of appliance marketing research.

Crosley Names H. J. Allen Refrigeration Sales Mgr.

CINCINNATI—H. J. Allen, appliance and sales executive for many years, has been named refrigeration sales manager for the Crosley Div. of Avco Mfg. Corp.

T. H. Mason, appliances general sales manager for Crosley, announced Allen's appointment which he said was effective immediately.

Since 1947 Allen has been with the Admiral Corp., most recently as sales manager of the Philadelphia region. Prior to that, he held several positions with RCA, as vice president of RCA Victor of Brazil; sales manager of the record division and field representative.

Appliance Dealer Advertises Complete Service Facilities

ERIE, Pa.—Its complete appliance service and extensive stock of parts was promoted by Winter's appliance store in an institutional newspaper advertisement.

Said copy: "Buy your appliances with confidence from Winter's. You can always depend on Winter's to keep your appliances in perfect running condition for many years to come. Backed by the largest and most complete service department in town.

"We stock over $50,000 in parts alone and employ an organization of 25 factory trained experts."

Wichita Appliance Dealers Sponsor 2nd Clinic Apr. 14

WICHITA, Kan.—How to train salesmen to sell instead of just taking orders; color television; practical ways to keep firm control of business procedures.

These will be topics of discussion during the second annual Appliance Dealers Clinic sponsored by the Wichita Appliance Dealers Association, Inc., at the Broadview hotel in Wichita, Kan. on April 14, according to WADA President Emerson Dole, The Appliance Center, Wichita.

Dole serves on the board of directors of the National Appliance & Radio-TV Dealers Association and is chairman of NARDA's Membership Committee.

It is expected that nearly 400 dealers and industry members will attend this clinic. NARDA Vice President H. B. Price, Jr., Price's, Norfolk, Va.; NARDA's Chairman of the Board Mort Farr, Upper Darby, Pa.; and NARDA Past President Wallace Johnston, Wallace Johnston Appliances, Inc., Memphis, Tenn., will head the list of speakers.

Ben-Hur Distributor Named

ST. LOUIS—Central States Distributors, Inc. here, has been appointed distributor of Ben-Hur freezers in the St. Louis trading area.

'We Haven't Reached Them with the Story . . .'

Appliance Market Potential Still Great, But Buyer Must Be Sold 'Easy-Living' Angle

WAUKEGAN, Ill. — American families will continue to buy new appliances in large volume but they must be shown how the appliances will make life easier, F. F. Duggan, vice president and general manager of Deepfreeze Appliance Div., Motor Products Corp., told business executives recently.

Speaking at a luncheon meeting of the Forward Div. of the Waukegan-North Chicago Chamber of Commerce, Duggan pointed out that today's selling problems are basically the same as usual for new products, but unlike those of the period immediately after World War II.

'THEY HAD TO BE SOLD'

"While the advantages of electric refrigerators over the old-fashioned icebox seem very obvious today, people didn't stampede to take them when they were new appliances," Duggan said. "They had to be sold.

"The refrigerator was not the first major appliance, but it was the first to be supported by sales and merchandising effort that brought about large volume, beginning about 1925. It was sold by trained salesmen who literally followed the iceman, calling on homes to talk about and demonstrate advantages."

In the post-war market of pent-up demand and tight supply of goods, industry did not need to talk about advantages, but it does today, Duggan said.

86 OUT OF 100 HOMES HAVE NO FREEZERS

"The main reason 86 out of 100 homes do not have a home freezer is that we haven't reached them with the story of what a freezer will do," he declared. "Some people don't know enough about the quality and variety of frozen foods and other freezer benefits, like time saved in preparing food and shopping, convenience for entertaining, and money savings."

Deepfreeze currently is putting increased emphasis on careful sales training, more attention in product literature to advantages in use rather than mechanical features, and greater stress on group and home demonstrations, Duggan reported.

The appliance market, he said, has a strong potential from the relatively new room air conditioner to the established refrigerator, of which more than 14 million units are obsolete.

Here, tube clamp is spot welded to tubing lines of Bundyweld in evaporator of home freezer. This leading manufacturer of home freezers, Deepfreeze Appliance Division of Motors Products Corp., knows that Bundyweld takes easily to intricate bends; holds up under the most complicated fabrication steps.

SPECIALTY SELLING METHODS

Dawn-to-Midnight Sale Clears Dealer Stock by Offering Hourly Specials

TWIN FALLS, Idaho—A special "Dawn to Midnight" Buy-A-Thon helped the C. C. Anderson's Appliance firm here clear an "astounding" amount of appliance merchandise.

The special Buy-A-Thon lasted from 6 a.m. until 12 midnight of that day. Specials were offered every hour on the hour.

For instance, at 9 o'clock a Frigidaire freezer listed at $439.95 was sold for $369.95.

At 10 o'clock a 1953 model Frigidaire refrigerator regularly selling at $295.95 was sold for $249.95.

Customers were told to use the rear door of the store before and after the business hours of the department store. The appliance department was kept open and customers streamed into the place to look over the merchandise.

A spokesman for the store said the unusual dawn-to-midnight sale had two advantages:

One, it had a novelty appeal; and two, it gave many persons who work odd hours of the day or night a chance to shop with their families.

A spokesman for the store said that the Buy-A-Thon was so successful that they planned to make it an annual affair.

Ad Offers To Meet Competitors After Comparison Shopping

MONTREAL, Que., Can. — Beside a drawing of a long, lanky salesman with feet crossed and patiently tapping his fingers as though waiting for his customer to make up her mind, Appliances Unlimited here ran this copy in a single column advertisement:

"We can wait. . . .

"While you stroll about town, checking prices and values.

"But when you're ready to buy that refrigerator, washing machine, television set, or what-you-will . . . we suggest that you walk into Appliances Unlimited, armed with the lowest quotation you've been able to find and challenge us with it.

"We'll probably be able to show you the identical appliance, and quote you our price. We make no blanket promises, but — confidentially, we'll be surprised if you're not surprised, and we do mean pleasantly!"

'Misplaced Item' Contest Sharpens Shoppers' Eyes

ERIE, Pa.—Arthur F. Schultz Co., appliance dealer, participated with other merchants in an unusual "Misplaced Item" contest sponsored by the Erie Chamber of Commerce.

Each of the merchants put in a window display in which it included one item that the store does not normally sell. Contestants were invited to identify that one item in as many store windows as possible and mail their entry blanks to the Chamber of Commerce.

The entry blank carried the names of all participating stores and a blank space opposite each store to identify the misplaced item.

Lists with the greatest number of correct answers received these prizes: First prize, $50 in merchandise; second prize, $30 in merchandise; third prize, $20 in merchandise; 21 consolation certificates.

Refrigerator, Freezer Trade-In Guide Released

NEW YORK CITY—The new 1954-55 edition of the Standard Refrigerator & Freezer Trade-In Manual & Dealer Guide is now available from Nelda Publications, Inc., here. This latest edition contains more than 2,000 pictures.

Checklist of Things To Do Now Helps Dealer To Prepare for Big Spring, Summer Sales

SYRACUSE, N. Y. — On the theory that how well a dealer prepares himself in March may determine how much he is going to sell this spring and summer, Carrier Corp. recently issued a checklist for air conditioning and ice maker dealers to help them in their "spring training."

For the room air conditioner dealer, Carrier suggested:

Get set financially for a big and active season.

Identify the outside of your place of business with the brands you carry.

Dress up your showroom with point-of-sale displays, banners, and easel cards.

Plan you local advertising schedule to tie in with national advertising.

Order your sales literature, advertising mats, radio recordings, and TV films.

Hold a kickoff sales meeting for your staff. Invite your distributor to provide sales training. Explain your local advertising and sales promotion program and how it ties in with national advertising. Distribute sales tools to your salesmen and explain how to use them.

ORGANIZE PROSPECT LISTS

Organize your prospect lists for personal selling and telephone canvassing. Develop a telephone technique that works—and stick to it.

Arrange a display in the lobbies of your local bank and power company.

Sign up for space in your local home show and see that you have the necessary display material and literature to pass out.

Check your sales manpower and installation crews.

Establish an installation card record system giving all pertinent data. This user list can be your best prospect list for next season.

Get an effective inventory record system in operation.

While most of these same points apply equally well to commercial and residential air conditioning and ice maker dealers, Carrier had these added special points to make.

For the commercial air conditioning dealer:

Review your mechanical facilities—sheet metal shop, plumbing, and electrical supplies—so you won't get caught short. See that subcontractors are all set for a busy season.

Set up a prospect list for direct mail programs. Plan a specialized direct mail program to precede the calls of salesmen to various markets.

Identify your hottest prospects and go after them now for early-season sales.

Consider a sales contest if you have three or more salesmen.

Study your most active competition and the equipment they sell. Be sure every member of your selling staff knows his strengths and weaknesses before the season starts to roll.

CONTACT COMMERCIAL USERS FOR RESIDENTIAL SALES

Write to all commercial and industrial users and try to sell them a unit for their homes.

For the residential air conditioning dealer:

Check your sales manpower and be sure you have at least one residential specialist who devotes his entire time to this important business.

Set up your prospect lists under three categories: speculative builders and developers, custom home builders, and architects.

Stage a meeting for builders, architects, realtors, and mortgage loan people. Show slide films, display equipment, and describe its features. Tell your story and distribute literature.

Contact every builder and architect in person and tell how you can help them sell their houses. Offer them your engineering help.

Promote an air conditioned home project as a "show window." Even one model home will help you dramatize your story.

SHOW FILMS TO CIVIC GROUPS

Arrange to show films on air conditioning to civic luncheon clubs, PTA, and church groups.

For the ice maker dealer:

Decide how you are going to sell—meter plan, no down payment, rental plan, or some other form of deferred payment.

Line up a local financial institution to operate on the plan you select.

Organize a sales force of specialty salesmen who know how to sell specialty items.

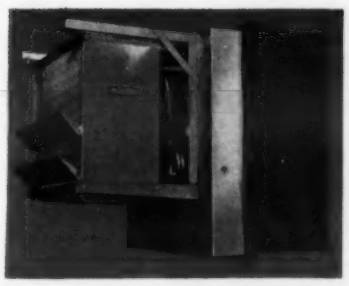
Contact local beer, liquor, and restaurant supply men. March is a notoriously slow month for them and they can be enlisted as bird dogs and a cash-per-converted-prospect basis.

Enlist your own and independent servicemen as bird dogs.

Assign salesmen to make a survey of every ice maker sold in your territory regardless of brand during the past five years. Experience proves that many of these old users are again in the market for a replacement machine or an additional one.

NEW KOOL-RITE FREEZER UNIT CUTS INSTALLATION COSTS

Kool-Rite development of Reverse Cycle



Kool-Rite Model FX

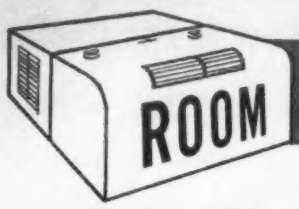
Automatic hot gas defrost, trouble-free performance and low cost are features of a new low-temperature package refrigeration unit manufactured by Kool-Rite Co., Roberts, Wisconsin. This unit has high and low side (complete with evaporator and compressor) mounted on a single panel for ease of installation.

Recently presented to the public, many buyers and manufacturers of walk-in freezers are now specifying Kool-Rite units for all low-temperature applications.

Kool-Rite freezer units are designed for applications requiring temperatures from -20° F. to 32° F. in any walk-in freezer made today. Reverse Cycle system provides comparatively frost-free operation. The unit will operate efficiently in surrounding temperatures as low as 20° F. This Kool-Rite development permits use of space formerly impracticable because of below normal room temperatures.

Completely automatic, Kool-Rite low-temperature systems defrost 4 to 8 times per day to give peak performance at a savings. Average defrost cycle is about 8 minutes, but can be adjusted to meet unusual requirements. Completely self-contained in one simple unit, Kool-Rite systems are easy to service.

For complete information without obligation, write today to Kool-Rite, Erickson Industries, Inc., Roberts, Wisconsin.



AIR CONDITIONERS

E. Glauber Heads Cooler Sales for Emerson Radio

NEW YORK CITY—E. R. Glauber has been appointed national sales manager for air conditioning by Emerson Radio & Phonograph Corp., it was announced recently by S. W. Gross, vice president in charge of sales.

E. R. Glauber

Glauber will continue in the capacity of director of Emerson Distributing Companies in addition to assuming his new duties of directing the sales activities of Emerson's air conditioning units which will be introduced early next month.

Glauber joined Emerson Radio & Phonograph Corp. on Oct. 5. His industry background includes a long period with the Admiral Corp., which he joined in 1947 as manager of its eastern distributing branches, later becoming vice president and general manager of its New York distributing division. Prior to this, he had been sales manager of Dale Distributing Corp., Admiral's New York distributor.

Fresh'nd-Aire Room Units Get A.M.A. Ad Acceptance

CHICAGO—J. W. Alsdorf, president of the Cory Corp., announced recently that the 1954 Fresh'nd-Aire "Electromagnetic" pushbutton automatic room air conditioners have earned the "Advertising Acceptance" emblem of the American Medical Association.

"This A. M. A. acceptance," Alsdorf points out, "means that the advertising claims made for the 1954 Fresh'nd-Aire models have been checked and passed by that organization's advertising committee."

The 115-volt, ½-ton and ¾-ton 1954 "Electromagnetic" pushbutton automatic models were also recently listed by Underwriters' Laboratories. According to the manufacturer all other units will be UL listed in a few weeks.

Luke Bros. Distributes Curtis

VALDOSTA, Ga.—Appointment of Luke Brothers as distributor of Curtis air conditioning equipment in the Valdosta area, has just been announced here.

Plenty at Steak In RCA Air Conditioning Contest —24 Steers To Be Exact

CAMDEN, N. J. — Distributor salesmen of RCA room air conditioners can win a herd of 24 prime steers—or, at least, the steaks from them—in a contest now under way.

Other prizes in the sales promotion campaign include RCA Estate kitchen ranges, RCA room air conditioners, and family-size home freezers.

The contest, which will have grand prize winners from eight geographical regions, closes April 30. It is being conducted by the RCA Air Conditioner Div.

Winners will be selected on the basis of individual sales records in the distributor organization that achieves the best over-all quota sales mark during the campaign in each region.

Contest officials estimate that it would take at least three top-grade 700-lb. steers to provide the prime steaks for the winner in each of the eight regions. Winners who receive steaks are assured a 3-lb. sirloin each week for a year, according to the firm.

Salesmen eligible for the contest are employed by wholesale distributorship organizations and call on retail dealers of RCA room air conditioners.

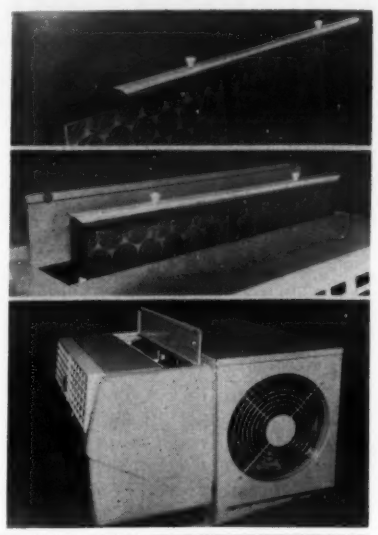
Plastic Holder Simplifies Job of Changing Filters

LONG ISLAND CITY, N. Y.—To simplify the job of changing filters in a room air conditioner, Anchor Plastics Co., Inc. here is producing an extruded plastic filter holder.

The holder is an extruded channel of ivory or maroon plastic, whose angle-cut ends smoothly grip the filter's edge. Two matched buttons screw onto the channel to act as handles.

With this device, the company says, the air conditioner owner can easily and cleanly lift out the used filter, slide it out of its frame, and then slide a new one into its place.

The filter holder is currently being used on Welbilt air conditioners made by the Welbilt Stove Co. of Maspeth, N. Y.



3-D Animated Display Helps Fresh'nd-Aire Dealers Promote Room Cooler Features

CHICAGO—To help its dealers and distributors promote features of the new Fresh'nd-Aire "Electromagnetic" air conditioners, Fresh'nd-Aire Co. has introduced a 3-D, full-color animated display.

This sales aid is the latest point-of-purchase creation of this division of Cory Corp.

"The header piece, which sits snugly atop any Fresh'nd-Aire model, is in brilliant full-color," it was pointed out. "Eye-stopping animation is achieved by alternating flasher lights which back-light this part of the display.

"First, the upper section flashes 'on' and calls immediate attention to the sales message about the Fresh'nd-Aire's exclusive Electromagnetic Push-Button All-Weather Control. Then, the lower part flashes 'on' and the hand touches one of the pushbutton controls to quickly show how easy the 1954 Fresh'nd-Aire Air Conditioner is to operate.

"In addition, there are two full-color illustrations which emphasize still another sales point — that pushbutton comfort is enjoyed by Fresh'nd-Aire owners and users in the summer and the winter or all year long. The new Fresh'nd-Aire's pushbutton color-coded keyboard also is shown just exactly as it appears on each 1954 model."

Each header display piece is constructed of heavy-duty cardboard.

To complement not only the header piece, but also the air conditioner itself, the pedestal base consists of a rigid, solid wood frame, on which the unit sits, and jet-black, tubular steel legs with non-skid rubber feet. A front sign on the pedestal base identifies the air conditioner.

The display occupies only 5 sq. ft. of floor space. Shipments of the displays are now being made to dealers and distributors.

Hospital Adds Emergency Power Source for Cooling

TOLEDO—Designed to assure uninterrupted operation of refrigeration equipment in case of power failures, a new $5,000 emergency power facility with a potential of 60,000 watts has been installed at Flower Hospital here, according to Elmer W. Paul, administrator.

The new pushbutton unit will be tied in to air conditioning units. A smaller standby unit, installed about a year ago, is capable of supplying power for refrigeration in the blood bank, pharmacy, and food storage sections.

Callan Retires as Manager Of Carey Mfg. Department

CINCINNATI—W. D. Callan has retired as manager of the Careyduct Dept. of The Philip Carey Mfg. Co. here, after many years in the heating and air conditioning field.

Remington Appoints New Distributors In 4 States

AUBURN, N. Y.—The appointment of four new distributors for Remington window and console room air conditioners has been announced here by M. L. Judd, Remington Corp. general sales manager.

In the 67 counties of the San Antonio, Texas trading area, the Remington line will be handled by the Standard Distributing Co. Contract was signed by J. H. Sterling, Standard's general sales manager and Hugh Vestal of Peabody Bros., Remington's Texas representative. Standard carried the Fedders-Quigan line in 1953.

For southeastern Pennsylvania, southern New Jersey, and Delaware, Remington has named Olson and Co., Philadelphia. Victor E. Olsen, president, and Frank Grott, Remington representative, negotiated the contract.

In Richmond and Norfolk, Va. Remington room units will be distributed by Tower-Binford, Richmond. W. T. Buckner, Tower-Binford president, signed with Remington representative W. H. Lassiter.

Dealers in south central and southeastern Kansas will be serviced for Remington by Electric Supply Co. of Wichita. The franchise was signed by L. M. Benefiel, Jr., general sales manager, and E. G. Sommerlath of Remington.

INSIDE DOPE

Learn to live and laugh—
Thus delay your epitaph

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)

"As cold is the lack of heat, so doubt is the lack of faith. The compressor in our religious experience should be used not to attempt production of doubt, but the transfer of faith!

"Consider the concentration of any great act of faith, and there will be evident proof of 'Compressed Christianity.'

"A victorious achievement of making faith warm and alive is the application of expelling the latent, and compressing the dynamic!

" 'Compressed Christianity' would take vapor-faith, and condense it into power! God giveth to man the knowledge that cold and doubt can be extricated, and growth sponsored!!"

The Score on Westinghouse

Opening of the tremendous new Westinghouse refrigerator plant in Columbus, Ohio is additional evidence that America's leading businessmen have great confidence in the future of our country.

At the same time, it has created a bit of confusion as to who is doing what and where in the sprawling Westinghouse industrial empire. Let's try to straighten it out for dealer subscribers.

The Electric Appliance Div., headquartered in Mansfield, Ohio, is one of 23 divisions operated by the Westinghouse Electric Corp. That Division is composed of four centers:

The East Springfield, Mass. plant produces refrigeration units, water and beverage coolers, fans, vacuum cleaners, food mixers, and food waste disposers.

The Mansfield factory turns out electric ranges, Laundromats, clothes dryers, refrigerators and home freezers (yes, for awhile yet), dishwashers, water heaters, and miscellaneous electric housewares.

The new Columbus, Ohio plant is devoted solely to refrigeration products.

From Newark, Ohio, this Division's repair, renewal, and service parts are stocked and distributed.

In the early 1900's, Westinghouse appliances consisted of approximately 10 table items which were made in East Pittsburgh, Pa. and Newark, N. J. At that time Westinghouse appliance sales were the responsibility of the Apparatus Supply Department. So it happened that a highly-trained technical engineer had to sell transformers and switchboards one day, and flat irons and fans the next.

The East Springfield, Mass. factory was established in 1915. First civilian products manufactured there were washing machines, small motors, automotive equipment (starters and generators), and fans.

Away back in 1917, Westinghouse purchased the Copeman Electric Stove Co. of Flint, Mich. Simultaneously, all Westinghouse appliances became the responsibility of the Merchandising Division. In March, 1918, this Division was moved to Mansfield, Ohio. Operations previously carried on at Flint, East Pittsburgh, and Newark, were pulled into Mansfield. Approximately 100 people were on the payroll there, and the factory covered nearly 100,000 sq. ft. of floor space. Sales billed in that year were counted in thousands of dollars. Today, the Mansfield plant covers 1,900,000 sq. ft., and yearly sales total hundreds of millions of dollars.

In 1923, the name Westinghouse Electric Products Co. was changed to Westinghouse Electric and Manufacturing Co. The present name—Westinghouse Electric Corp.—was not adopted until 1942, when, at the same time, the Merchandising Division became the Electric Appliance Division.

During the late, unlamented Depression this Division added refrigerators, water heaters, vacuum cleaners, roasters, and dishwashers to its line. Laundromat automatic washers were marketed in 1940.

With the outbreak of World War II, production of home appliances ceased and the Westinghouse appliance plants turned to the manufacture of binoculars, bomb fuses, tank gun stabilizers, radio transmitters, and depth controls as well as fabricated airplane parts for the Armed Forces.

Shortly after V-E Day, the Electric Appliance Division embarked on an $11,500,000 expansion program that brought its over-all production level 50% higher than pre-war. It also made possible the manufacture of new things by the Mansfield and East Springfield plants, such as automatic clothes dryers, food waste disposers, electric bed coverings, electric griddles, waffle baker and sandwich grill combinations, steam irons, open handle dry irons and additions to the vacuum cleaner line.

A renewal parts service depot was established that same year in Newark, Ohio, to service all appliances made by Mansfield. Later, all renewal parts manufactured by the Division's East Springfield plant were concentrated there.

The Newark plant has nearly 115,000 sq. ft. of floor space devoted to renewal parts storage, and 20,000 sq. ft. to manufacturing. More than 14,000 styles of renewal parts are handled, stored, and shipped to distributors. Approximately 2,500 orders a day are filled.

In 1952 Westinghouse added Cook-N-Fryers, dehumidifiers, and room air conditioners to its product lines.

A second wave of postwar expansion for the Electric Appliance Division was initiated with the decision to build a plant in Columbus, Ohio, devoted to refrigerated products—the largest plant ever built by Westinghouse.

Situated on a 315-acre site, it consumes approximately 2,000,000 sq. ft. of floor space, and at top capacity can produce 4,000 major appliances a day. Its roof covers 45 acres of plant area.

This enormous plant has four manufacturing aisles, each 200 ft. wide and extending nearly 1,500 ft. Those aisles lead, in a straight line production pattern, to the warehouse area—which has the almost astounding storage capacity of 100,000 major household appliances.

This year the Westinghouse Electric Appliance Division began a seven million dollar expansion program to rearrange and expand its factories in Mansfield and East Springfield. The plan is to double production of several major appliances, and substantially increase production of refrigeration specialties products.

To keep pace with the expansion of manufacturing facilities and additions of new products to its lines, the Electric Appliance Division and its field organization at that time was divided into three product operations—major appliances, portable appliances, and refrigeration specialties.

Is all this clear to you, Mr. Dealer?

Oh, yes. One more item of explanation: John Ashbaugh is Vice President in Charge of the Appliance Division, and George Meilinger is Sales Manager. J. R. Clemens is Advertising Manager. Product managers include Stan Stephenson, refrigerators and freezers; Jack Lee, laundry equipment; Bob Brook, ranges; and Frank Lowery, kitchen utilities.

Godspeed you, merry gentlemen of Westinghouse.

Forum on Residential Air Conditioning Pinpoints Potential, Problems Involved

Residential Air Conditioning

This is the second in the series of articles presenting the transcribed report of the forum on residential air conditioning held recently by the Baltimore-Washington section of the American Society of Refrigerating Engineers which the NEWS was privileged to tape record in its entirety.

Published in the last issue were the formal talks of F. Dunning Rupprecht, who served as moderator; Curt Mack, assistant commissioner, underwriting, Federal Housing Authority, and Harry Sarshik, president, Home Builders League of South Jersey.

Many Reasons Back 'Fantastic' Estimates Of Future, Says Manufacturers' Spokesman

By George S. Jones, Managing Director, Air-Conditioning and Refrigeration Institute

Man since time began has been interested primarily in three areas: Food, clothing, and shelter. And his ability to warm himself and clothe himself has made it possible for him to occupy areas that otherwise he would not occupy.

To those of us in the refrigeration industry I think it's a very consoling and very interesting fact that we have contributed a lot and will contribute a lot more to two of those areas—the food and the shelter, to the processing and preservation of food, and to the comfort and the sanitation of the dwellings occupied by man.

We are confining our discussion tonight to that part of the refrigeration industry that has to do with the control of air conditions in the dwellings we occupy, and particularly to what has been generally referred to as year-round residential air conditioning.

It's pretty easy to get very enthusiastic about that. Man's been able, as I said just now, to move up from the tropical swamp in which he climbed up a good many centuries ago, to move into and locate and develop areas of colder climates only because of his ability to heat those dwellings.

It's a rather interesting corollary, it seems to me, that there seems to be some connection between the standard of living and the quality of that heating. I think heating is both a cause and effect to some extent of the progress of man.

During the centuries they have developed better and better ways of heating a home. In this country some 25,000,000 central heating systems have been built, sold, and installed. And in describing the potentials of the industry, although I know we're interested primarily in new homes tonight, I think it will bear repeating that of 25,000,000 centrally heated dwellings in this country, over 50%, over 13,000,000, have warm air. And I think that we can consider that that is a primary market for this industry that we're interested in.

Don't Forget Wet Heat Jobs

Nor should we forget the approximately 11,000,000 homes that have wet heat, because more and more we are finding practical and satisfactory means of installing either chilled-water units or separate packaged summer conditioning. It is of direct interest to us as we talk about the new homes because the volume of our business will be a major factor in the development and improvement in design and lowering of cost of those products that are made available for inclusion in the new home.

In addition to the existing homes that have been built over the last seven years, there are 1,000,000 new ones annually. That represents our potential, and I don't think we should call it fantastic. How far we go in reaching that potential, how soon we get there, remains to be developed. But I think it justifies the statement that today's new industry progresses at a much more rapid rate than did industry of a few years ago.

We're just getting started, but even in that start I think there's some drama. I doubt if there were over 5,000 residences air conditioned at the end of World War II. In 1952, to the best of our knowledge, there were some 15,000 to 20,000 homes that installed year-round conditioners. The figures are fairly accurate for 1953, indicating between 50,000 and 60,000 homes in that year.

We're projecting anywhere from 100,000 to 120,000 homes in 1954. And the same people on the basis of well considered estimates are predicting up to 700,000 residential units in new and existing homes by 1958.

It sounds a little fantastic, but there are many reasons for believing that might be realized. There's a lot of pressure from many angles, not only the factors that influence the man himself in his desire to own it.

We're getting pressure, thank goodness, from the home builders, who in spite of the fact that we haven't been able to realize completely their objectives, are still thinking that their answer to their industry and to the satisfactory housing of America is the creation of obsolescence. And air conditioning can certainly be one of the factors to create that obsolescence.

American industry, American prosperity has been built to no small degree on the simple premise of making you dissatisfied with that which you have. "Boss" Kettering of General Motors many times has said that he's getting awfully tired of people talking about "satisfied customers." He doesn't like 'em. He wants to build a new automobile today so that the one you bought yesterday is unsatisfactory to you. I think we have proven pretty conclusively that from the standpoint of economics and otherwise, it's a pretty sound program.

Resale Value Higher

The investment banker is thinking very seriously of the possibility that an air conditioned home is a better investment, that its resale value is higher than a non-air conditioned home.

Your economist, who's interested in the economic health of the country, who worries from time to time as most of us will about the employment, is interested in the tremendous number of man hours that might be provided as this almost new industry takes hold and reaches these rather stratospheric figures that I've mentioned.

There are other factors that go toward convincing us that perhaps we can realize some of these objectives in the not too distant future. We've come a long ways, but we've got a long ways to go. We've got much to do. Much is dependent upon the group here tonight, the American Society of Refrigerating Engineers.

Out of your contributions in developing refrigeration compressors and condensing units this thing has become possible. And out of your ability we expect to attain

(Continued on next page)

User's Neighbor Seen as Best Prospect--

(Continued from preceding page) these things that have been mentioned already as necessary, such as lowered costs, use of new materials, better processes. All of it together to fit more soundly into the economic picture.

We certainly need a better trained, a more capable, a better informed group of sales people, as has also been mentioned. We have not scratched the surface on the reasons for air conditioning. Further research will certainly develop that. I think it's fairly easy. It won't sell itself, but certainly the man next door to the man that just installed a year-round job is about the best prospect I know of.

If we can develop those, if we can bring the cost down, if we can develop the standards of performance, the standards of integrity, if you please, and I think that is essential, then I think these things are possible.

We've got all of the ingredients, we've got the product well along the way of development, we've got the engineering ability to improve it, we've got the desire of the public, we've got the desire of these other agencies. All of the ingredients are there to make a pretty good pie, and all we've got to do is see that those ingredients are the proper quality, and combined with the proper mixture.

I think we have every reason to believe that air conditioning can and will be one of the great American industries.

50% of Jobs 'Nothing Short of Appalling,' Claims Engineer after Research In Texas

By C. W. Nessel, Chairman, Field Investigation Committee, National Warm Air Heating & Air Conditioning Association

I'm not going to sit here tonight and pose as an authority on the engineering problems of residential air conditioning. Frankly, in my opinion, there is no such person. I knew a lot more about heating 20 years ago than I know today, and I know a lot less today about residential air conditioning than I did two years ago.

I am chairman of a group working with the National Warm Air Heating and Air Conditioning Association that has the high-sounding title of Field Investigation Committee.

The National Warm Air Association is primarily an association made up of manufacturers of warm air furnaces, perhaps some 150 of them, the manufacturers of residential air conditioning units that can be attached to a warm air heating system, and their number is at the moment unknown because it varies from week to week. We have some 3,000 or 4,000 dealers who are installing this equipment all over the United States, and perhaps 150 to 200 jobbers and wholesalers.

All of these various groups are represented on all of the major committees of the association. The Field Investigation Committee was appointed to supplement the rather formal research work that's done by the University of Illinois.

We are nothing but a bunch of snoopers. We have a mobile laboratory filled up with about $5,000 worth of test equipment. We back up to someone's front door every Monday and invite the lady of the house to let us live with her for a week, and to snoop into all her private affairs and become particularly interested in her thermal environment. We're usually welcomed with open arms, although I must confess to you that a canned ham has a terrific impact upon a woman's resistance—something I should have learned 20 years ago.

Last summer and the previous summer we investigated the aspects of residential cooling. We selected Texas because in no place in the United States has God been more generous to the populace with respect to hot, humid, muggy weather than in Texas. We are assured of from 14 to 18 weeks of uninterrupted research down there.

Jobs Sized by Area

In the few minutes that are allotted to me I would like to tell you just a few of the things that we have found. I would like to tell you that in about 50% of the jobs that we have investigated, the things that we have found have been nothing short of appalling. Mention was made of the fact that the average dealer, or many dealers, have an inclination to size the cooling equipment by square foot of floor area, and so they have.

Of these 50%—the rather appalling jobs—that we have checked, we found that virtually all of them were sized on a 500 sq. ft. per ton basis, and if the man thought that his competitor was sizing it on 500 ft. per ton, and he might not get the job, he would use any figure from there on up that he thought would work.

On none of these jobs—this 50%—did we find any heat gain calculations made whatsoever. And you ask him what the heat gain was, and he didn't know, nor did he give a damn. He simply installed a cooling unit.

I remember one dealer, and here is another pitfall, rather I remember one builder, with all due respect to our builders, who built a model home. He put in a 2-ton cooling unit. The model home was carefully calculated with respect to heat gain. The window orientation was taken into account. Everything that should be taken into account was there, and he came up with a 2-ton unit and it was installed.

Then he proceeded to build some 30 or 40 additional houses. Now the 2-ton job in the first house was on display and it worked fine. But then he went and built the other 30 houses without any recalculation of the heat loss or heat gain irrespective of their orientation. And when he had shifted the house around, so that a big picture window got the sun, his air conditioning system in about half of the rest of the homes was completely and totally inadequate, simply because he calculated the heat gain on one house only.

Undersized Unit Better

In our work we have found that a slightly undersized unit does a much better job than one that is right on the button or a little bit oversized. We like to see a machine that will run from 5½ to 15 hours a day continuous operation uninterrupted. When that takes place there is a good dry-bulb temperature gradient in the house. But more significantly, that continuous operation of that compressor is constantly pulling down the relative humidity of the house, which is a terrifically important factor down in Texas where just stepping outdoors causes the sweat to pop out of every pore in your body as though you were a fountain.

Humidity Held Down

It's only when the compressor gets on intermittent operation at the end of the peak period does the relative humidity in the house begin to climb much above 50% where it was designed to stay.

Oh, I might go on and tell you a lot more things. I'd like to point out to you a source of latent heat that most of the dealers and installers down in Texas have missed completely. We had, for example, two beautiful homes, one with a 3-ton unit and one with a 7½. The man who owned the 7½-ton unit said, "I can't stand it any more. I have to swim from my bed to the bathroom."

Water on Registers

And there were beads of water laying all across the bottom of every high-side wall register in that lovely, beautiful home, lovely little streams and trickles running down the wall to deface the wall surfaces.

In another home, a more modest place, the lady was in tears. She pulled aside her clothes hanging in the racks in the closets, and said:

(Continued on next page)

Humidity Major Problem, Engineer Finds--

(Continued from preceding page)

"See these sacks of silica gel. Why do you suppose they're there? Because my clothes are mildewing hanging on the racks."

She lifted up the end of the bedspread and showed me the mold and mildew on the mattress. In every case the relative humidity in that house, in both those houses, and we've checked a number of them since, was up in the high 70's with the machine designed properly for the job.

Roofing Drops Humidity

Investigation showed that an innocent-looking crawl space underneath the house with the vent openings installed and open—as per FHA requirements—that moisture from the ground was getting up into the crawl space atmosphere and migrating on up through the floor and into the house. And when we got down in those two crawl spaces and covered that earth with 55-lb. roll roofing, as an effective moisture barrier, the trouble disappeared overnight. And instead of having 75% r.h. in the house, we had it down to below 50%.

Migration of Moisture

I'm almost inclined to believe that even an innocent-looking crawl space that looks as dry as sand should have a moisture membrane over the earth because we have found that same migration of moisture in summer and in winter.

I'd like to just mention one more thing. That is fan operation. I think nobody in the industry knows right now whether the fan of a residential air conditioning system should be operated continuously or intermittently unless reheat is put into the small residential job, and I need not tell you that it is not going to go in a small residential job and still satisfy FHA costs.

Intermittent Fan Best

We have discovered on the intermittently fan-operated jobs that we maintained a rather uniform relative humidity level in the house, while we have found on the continuously-operating fan that at the end of every compressor cycle there was a bump up in relative humidity.

We would carry on through the day at probably 50% r.h. Then came the end of the peak period. Then came an off period, 15 minutes perhaps. Then the compressor started. But the fan running continuously built up that relative humidity anywhere from 2% to 5%. At the start of the next cycle it went down a little bit, but not all the way. And so progressively it went higher and higher and higher.

And we find there is a direct relationship between the moisture regain and the position of the coil and the drainage provisions on the coil and how the coil is set with respect to the air flow.

In conclusion I'd just like to pass a word along about operating expense, and I've left out about 7,500 other comments that I might otherwise have made if I had an hour and a half here.

Cost of Operation

One man came to me down in Texas and he said, "Bill, I don't like the operating cost of my air conditioning system. My electric bill during the month of July for a 3-ton unit when it was hotter than a blister outside was $26.50 for electricity alone."

Now, incidentally, he cooled with water, and his water bill likewise was about $26 for that month. When he put in a cooling tower he cut the water bill down to $2 a month, but he said, "I can't stand this $26."

I said, "What is your highest gas bill?"

He looked it up. It was $27 for one month. And when we added it all up and divided it all by 12, we found that the average cost over a five-month period of cooling and a seven-month period of heating was just about the same per month.

So I think we've got to look at these operating costs, not by the month when the peak occurred but we have to take into account the whole cooling period.

Residential Air Conditioning

Question-Answer Session Points Need For Vapor Barrier on Crawl Space Earth

Q. Let's have some information about this business of moisture running down the walls.

Nessel: We find that down in Texas that can be a very real problem. I'm going to go to a third house in discussing this thing with you. This was a house of about 1,600 sq. ft. It had a 3-ton cooling unit in it. It had continuous air circulation.

We found that we could not get the relative humidity in that house down below about 72% although the dry bulb was down where it belonged, indicating that the machine was doing the proper sensible load but was unable to handle the latent load.

We inspected the outside of the house and found that the vent openings were a prescribed size, met the prescribed formula, and were strategically located so that there should have been air ventilation through and under the crawl space area. We got down into the crawl space, but unfortunately our technician is a great big fat boozer and he couldn't get very far in this crawl space area because of his bulk, so I had to go in it myself.

Mud Head to Foot

When I came out I was mud from head to foot. Now this situation was made much the worse by the fact that in spite of all these vent openings, which were properly installed and properly sized, there were a number of ducts in this crawl space, anywhere from 8 to 10 in. in diameter, round pipes, insulated with 2 in. of insulation around them.

There was not one trace of air circulation through that crawl area. And none of the moisture in that crawl space was taken out of the crawl space except that which migrated up through the floor.

We found that the floor joists, now this house was only a year old, had a wood moisture content of some 23% to 24%. The Bureau of Forest Pathology tells us that when you get much over 20%, you're in danger of all matter of destruction that can happen to wood, including dry rot (that seems kind of screwy—dry rot in wet lumber), fungus growth, and all the other things that happen to lumber.

Now, in that particular job there was not a thing we could do without ripping up, completely ripping up, all of the ducts in order to get that moisture membrane underneath. In one of these other houses that I mentioned where we had almost a similar experience, except that in that house the vent openings, while they were the right size were not so located strategically to give the right ventilation across. In that house we could crawl around on our stomachs in the crawl space, 18 in. deep.

Water Came from Lawn

The man who owned the house said to me, "How could that ground be wet? We haven't had a rain down here in Texas for three months."

However, he forgot that he watered the grass for the last three months every day and every night and that water was crawling under the house from the wet lawn. That dirt in the crawl space was so wet that when we took a dry silica gel test (that's a dry sack of silica gel in a chamber 18 in. square) over this wet dirt, we got enough water at the end of 48 hours to half fill that glass.

We proposed as an experiment that someone get down in that hole and cover the crawl space earth with roll roofing, and they invited us to do it. So we did it.

I would like to point out that prior to the placement of the moisture membrane we had a relative humidity in the crawl space that was off the chart. We used a hair hygrometer to make those tests and a hair hygrometer loses control at about 90% relative, so you guess with me what the relative humidity was. It was wet enough to rain. The relative humidity up in the house was about 72% to 74% at one time.

We got a moisture test on the wood and that ran 23%.

Humidity Down Sharply

After we placed the moisture membrane down we went back two weeks later to run another test. We found the relative humidity in the crawl space was slightly below that of the out of doors. We couldn't expect any better than that. We found that the moisture content of the wood had dropped down to about 16%, which is well below the danger mark. And we found that the relative humidity upstairs in the house was down to 46%.

I think it's highly important that material be put down. I'm not going to argue with anybody when they say, "well, look, this ground is dry." I don't believe it. It may be dry today, and it may be as wet as a lake tomorrow. And the fact that it looks dry doesn't mean that it is, because we have found evidence of moisture coming up from the earth through dry sand that would trickle between your fingers.

Rupprecht: I'm going to take the liberty to ask our builder to make his comments on this problem.

Had Problem Before

Sarshik: I would just like to reemphasize the point that Bill made, that he's as close to being 200% right as you can get to that percentage. I think it was in 1950 or '51 when the housing and home finance agency published that wonderful book, "Condensation Control," in which they outlined that the closest thing to perpetual motion is the constant generation of moisture out of the ground that goes on 24 hours a day with no stopping.

The FHA and other governmental agencies took cognizance of this at that time and most of the minimum construction requirements now require or have for the past several years that a suitable vapor barrier be installed on the ground and, of course, lapped up along the side. It's not quite necessary to seal the joints as long as there's an overlapping or 2 or 3 in. at the joints.

We had these problems of excess moisture prior to air conditioning, and I think this just helps to emphasize the problem.

(To Be Continued)

Evaporative Cooling

Engineering Approach to Subject Analyzes Advantages, Limitations for Air Force Conference

*By S. F. Duncan, Director of Research and Development, Farr Co.**

Exclusive Report of Air Force Conference

The NEWS presents here the first instalment of a series of papers on various phases of air conditioning which were given at the Refrigeration & Air Conditioning Engineers' Conference staged by Headquarters, United States Air Force, at the Pentagon in Washington, D. C., recently.

The discussion on evaporative cooling will be published in several instalments. Other papers given at the conference will follow.

Editor's Note: The Air Force advises: "The Air Force has established their Air Weather Service as the sole source of Weather Data to be used in determining the need for as well as the design of Evaporative Cooling Equipment. Such data was not available for study by the author at the time this paper was prepared. Accordingly, Weather Bureau and Marley Weather Data was used by the author rather than official Air Force records in the preparation of this paper."

A comfort-conscious citizenry plus equipment-conscious manufacturers aided by working engineers have lifted our oldest cooling method from an often felt but little appreciated natural phenomenon to a controlled means of extending the comfort of coolness to many more people. This has been a gradual process coming from the time of the wet sack in the window and the wet burlap covered food storage racks to the present carefully designed, efficient equipment.

Design Criteria

The equipment ranges in design from the propeller fan excelsior pad window cooler to evaporative units engineered for long life, easy maintenance, and high efficiency. The present need is for engineers to understand that evaporative cooling equipment has progressed in quality to the point where its specification and the sizing and design of the installation merits as much consideration as any other cooling means.

The versatility and practically unlimited range of application of mechanical refrigeration makes this means of air conditioning paramount in the field, but it does not mean that it must be used in all cases. Along with comfort consciousness, we have all around us cost-conscious potential buyers of cooling equipment. Admittedly, mechanical refrigeration is expensive, but if a less costly means of doing an acceptable job is available, then it should be, and in most cases will be, used.

It is the purpose of this paper to discuss the field of application of evaporative cooling, the capabilities, and limitations of this kind of cooling, and show that it is amenable to design treatments accorded the better-known cooling and heating problems. With better understanding of the potentialities of this cooling process, it is hoped designers will give it more than the rule of thumb attention it has all too frequently been accorded in the past.

Adiabatic Process

The mechanism by which air is cooled when passing over a wetted surface is referred to as adiabatic. The coolers are frequently termed adiabatic coolers. In its strict sense, adiabatic means that the process proceeds without transfer of heat to or from the surroundings. Applied to evaporative cooling, this means that no heat is transferred through the walls of the encasing structure around the evaporative unit.

Current designs of coolers approach this situation. Careful testing, however, reveals that the process deviates from the adiabatic line by a small amount. The deviation is dependent on many factors such as the sun effect on the cooler housing, wind exposure, surface characteristics of the housing, etc. The amount of deviation is small and requires rather elaborate test equipment to detect. In this discussion the evaporative process will be assumed to follow an adiabatic line.

The familiar psychrometric chart is one of the important tools of air conditioning engineering. It is available in several forms of which the General Electric and ASHVE charts are examples. A more detailed and comprehensive treatment of psychrometric data is found in "Psychrometric Charts and Tables" by Zimmerman and Levine, published by Industrial Research Services.

Using 'Psych' Chart

In using the psychrometric chart for evaporative cooling design, the process of cooling should follow an adiabatic line. On the ASHVE and Zimmerman and Levine charts these lines are designated as constant enthalpy or adiabatic saturation lines. These lines are very close to lines of constant wet bulb. On the General Electric chart, adiabatic processes are traced along constant wet-bulb lines, there being no special constant enthalpy lines.

The error involved in using constant wet-bulb lines instead of true adiabatic lines is usually less than 0.3° F. in final temperature. Design assumptions are not this close, so constant wet-bulb lines are considered satisfactory and psychrometric chart work quoted in this paper will be based on the General Electric chart and constant wet-bulb lines, principally for economy in slide making.

Defining evaporative cooling of air as an adiabatic process requires that the internal heat transfer of the process be examined. This internal heat transfer is the familiar one in which the heat necessary to evaporate the water is derived from the air into which the water evaporates.

This does not require a change in temperature of the water since the latent heat of vaporization is absorbed by the water at constant temperature. Since the air remains a gas throughout the process, it must lose sensible heat and so is cooled.

As far as the water is concerned, it can enter the cooler at a temperature above the wet-bulb temperature and be first cooled to wet bulb and then evaporate. There is no significant error involved in neglecting the cooling of the water to wet bulb since the heat required is usually less than 10 B.t.u. per pound of water while the heat absorbed during evaporation is close to 1,065 B.t.u. per pound.

From the above it is clear that the cooling of the air can be directly related to the amount of water evaporated. Since only the water evaporates, any dissolved solids are left behind to be disposed of somehow. Typical water analyses give total dissolved solids content up to 1,000 p.p.m. or 0.001 lb. per pound of water.

To estimate the possible amount of salt that could be deposited in a season of cooling, assume a 6,000 c.f.m. cooler reducing the air temperature 25° F. from 105° F. to 80° F. along a 68° F. wet-bulb line. Data taken from a psychrometric chart shows that the moisture pick-up is 0.0056 lbs. per lb. dry air and that the specific volume is about 14.1 cu. ft. per lb. dry air.

Assuming further that a season will be equivalent to 500 hours operation at these conditions, it works out that about 70 lbs. of salt could be deposited, or a little over 1⅛ lbs. per 100 c.f.m. per season. Obviously some provision must be

(Continued on next page)

*Presented before the Refrigeration & Air Conditioning Engineers' Conference of Headquarters, United States Air Force, held at Washington, D. C.

Study of Comfort Zone Data Indicates Field for Evap. Cooling Applications

(Continued from preceding page)
made to accommodate or remove such a deposit. This matter will be discussed later.

Area Weather Data

The cooling of the air passing through the evaporative cooler has been described as closely approximating a constant wet-bulb process. With perfect performance of the cooler, the wet-bulb temperature is the ideal limit of the temperature of the cooled air. The wet-bulb temperature prevailing in the locality where evaporative cooling is considered thus becomes one of the important factors in the design of the system.

The local dry-bulb temperature is also important since, if it is not high enough to make people reasonably uncomfortable, no cooling is needed. The combination of wet bulb and dry-bulb temperature, the efficiency of the evaporative cooler, and their relation to the resulting temperature in the cooled space are prime factors in arriving at a decision on the application of evaporative cooling.

The local wet bulb and dry-bulb summer temperatures are available in table and chart form in various publications such as the ASHVE Guide, the Marley Engineering Manual for Industrial Cooling Towers, text books, and from other manufacturers such as Carrier Corp. Local data not tabulated in comprehensive compilations can usually be obtained from the U. S. Weather Bureau. Though other sources are available, the ones cited are typical.

One minor fault common to all tabulated data on wet bulb and dry-bulb temperatures so far examined by the author is that there is no data on co-existing wet and dry-bulb temperatures. Data of this nature might add a refinement to evaporative cooling design, but past experience indicates that this refinement is not necessary.

Since the usual object of evaporative cooling is to increase the comfort of individuals, the discussion of the application of this type of cooling will begin with the so-called comfort zone. The data on which this zone was delineated was obtained by asking people whether or not they were comfortable and then noting the wet bulb and dry-bulb temperatures of the surrounding air.

Effective Temperature

The statistical study of the results developed the Effective Temperature Index. The idea is that at a certain effective temperature index, people will feel uniformly comfortable though the wet bulb and dry-bulb temperatures vary. The Comfort Zone is defined as the range of effective temperatures over which 50% or more of the people feel comfortable.

Data taken from the ASHVE Comfort Chart for Still Air as published in the 1953 Guide has been plotted on the psychrometric chart in Fig. 1. The center line is at 71° F. ET and is the ET at which 98% of the people feel comfortable.

The 50% lines mark the boundaries of the Comfort Zone and are drawn here for the full range of humidities from 10% to 100%. The study from which the data was derived covered the 30% to 70% RH range but it is safe to extrapolate the humidity range from 20% to 80% as a reasonable working limit for comfort.

It must be remembered that the Comfort Zone covers the conditions under which at least 50% of the persons occupying the space for an hour or more say they feel comfortable. It does not necessarily apply to the temporary occupant or visitor. Another point to be remembered is that the Comfort Zone does not necessarily mark the boundary of conditions tolerable to people.

The 0% line on Fig. 1 marks the limit above which no one asked felt comfortable. In between the 0% line and the upper 50% line some people are comfortable and many others will certainly be less uncomfortable than they would be under conditions above the 0% line. The zone between the 0% and 50% line should not be ruled out or overlooked as containing tolerable space conditions, particularly if local weather data shows that extreme outdoor heat occurs irregularly and for short periods only.

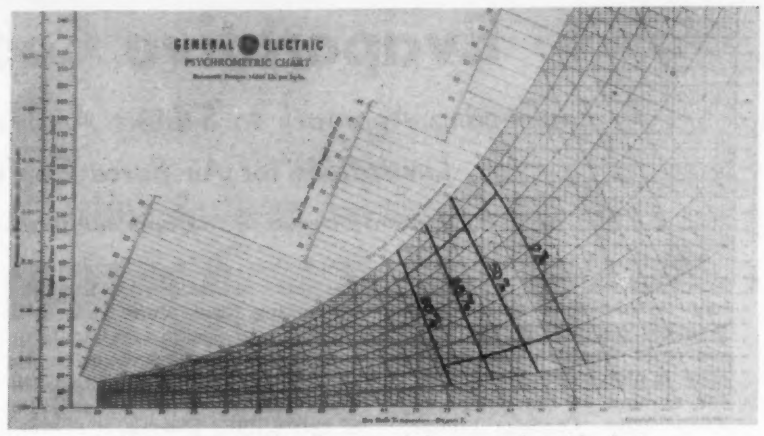


FIG. 1 shows Comfort Zone boundaries on psychrometric chart.

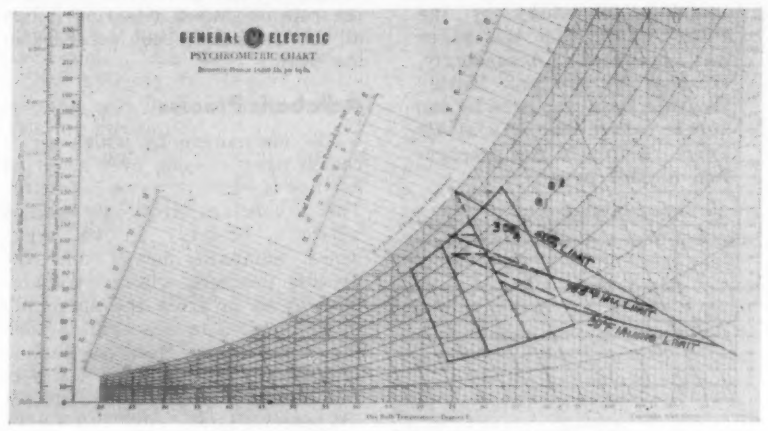


FIG. 2 indicates method of determining limit conditions.

It is interesting to note that the effective temperature limit lines of the zones selected follow lines of constant density very closely.

To establish the limit lines of conditions under which an evaporative cooler could deliver air cooled to the 50% comfort zone line, an efficiency of the cooler must be assumed. Evaporative cooler efficiency or humidifying efficiency is defined as the drop in dry-bulb temperature produced in the air passing the cooler divided by the wet-bulb depression of the air entering the cooler.

Specifications based on current manufacturers data have required a minimum efficiency of 80% when the entering air is 90° F. dry bulb and 70° F. wet bulb and the air flow is at the rated value for the cooler. As will be discussed later, testing at this one point does not give full information. Efficiency varies not only with air flow and wet bulb, but possibly with wet-bulb depression. For the present purpose it will be assumed that the cooler efficiency is constant at 80%.

Under the 80% efficiency assumption, the wet-bulb depression at any point on the upper 50% line in Fig. 1 will be 20% of the initial wet-bulb depression. Computing this initial wet-bulb depression and adding it to the wet bulb for the point chosen will give the limiting initial dry bulb at the chosen wet bulb.

Performing this arithmetic for several points on the 50% line and plotting the results give the "50% limit" line on Fig. 2. This line marks the upper limit of wet bulb-dry bulb combinations from which an 80% efficient evaporative cooler can deliver air of an arbitrarily defined comfortable nature.

While this 50% limit line is interesting as showing the wide range of theoretical conditions available for evaporative cooling, it must be modified for practical use. This modification takes into account the fact that, in order to cool a space, the heat entering that space must be removed. With cool air as the only means of removing the heat, it follows that the cool air must be warmed and then discharged from the space.

Uses 100% Fresh Air

It is for this reason that evaporative cooling uses 100% fresh air and cannot recirculate any of the air. This warming process will take place largely by mixing the cool air with the residual air in the space and continuously discharging the mixture at a rate equal to the inflow of cool air. The temperature of the mixture will be the temperature of the space.

For the purpose of illustrating the method of determining the limit conditions including the effect of mixing, a cooled space or mixture temperature of 78.5° F. dry bulb will be assumed. Further, the mixing process will be assumed

(Continued on next page)

Engineering Analysis For Evap. Cooling

(Continued from preceding page)

to take place at constant specific humidity or moisture content. The large volume of circulating air makes the small addition of moisture from occupants negligible.

As shown by a point on Fig. 2, the upper 50% comfort line and the 78.5° F. dry-bulb line intersect at 104 grains of moisture per lb. dry air. Proceeding to the left on this constant moisture line is following the mixing process in reverse. Taking a 70° F. outdoor wet bulb as an example, it is seen that the cool air started mixing at 74° F. dry bulb.

Noting again that the wet-bulb depression at this point (74 — 70 = 4.0° F.), is 20% of the initial wet-bulb depression because of the assumed 80% efficiency, the outdoor dry bulb is computed as:

$$70 + \frac{4.0}{.20} = 70 + 20 = 90° \text{ F.}$$

Following the 70° F. wet-bulb line down to 90° F. dry bulb gives the point representing the upper limit of outdoor dry bulb at 70° F. wet bulb for a 78.5° F. mixture temperature. It should be noted that the chart process just described is just the reverse of that used to find a mixture temperature condition, given outdoor conditions, and cooler efficiency.

Plotting Mixing Limit

Repeating this process for several points allows plotting the "78.5° F. mixing limit" line. The significance of this line is that for weather conditions falling below this line and to the left of its intersection with the "50% limit" line, 80% efficient evaporative cooling will produce a cooled space temperature of at least 78.5° F. dry bulb and be within the comfort zone.

For dry-bulb temperatures in excess of 106.5° F., a temperature of 78.5° F. cannot be reached by 80% efficient evaporative cooling and the final temperature will be outside the 50% comfort zone unless the wet bulb is lower than about 71° F. To illustrate the change in limiting conditions the "80° F. mixing limit" line is also shown on Fig. 2. This line was located assuming cooler efficiency as a constant 80% and a final mixture or space temperature of 80° F.

Values Representative

Obviously, choosing different efficiencies or mixing temperatures will change the location of the limit line but the values chosen are representative and serve for illustration.

The short constant moisture lines on the process lines, shown on Fig. 2, determine the temperature rise available in the cool air to remove heat and still have the mixture temperature be on the upper 50% line. At any chosen space temperature, it is clear from the examples chosen that at higher outdoor wet bulb the heat absorbing capacity of a cubic foot or pound of cool air decreases. Since heat must be absorbed by the cool air to take care of the cooling load, a reasonable temperature rise must be allowed to keep the amount of air required down to manageable quantities.

Taking 14.3 cu. ft./lb. as a representative specific volume for air entering the cooler and 0.24 Btu./lb./°F. as the specific heat of moist air based on the weight of dry air, it appears that 14.3 cu. ft. of air can absorb about ¼ B.t.u. per °F. temperature rise. This works out to 16.8 B.t.u./1,000 c.f./°F. temperature rise.

Reasonable Rise

It is apparent that a reasonable temperature rise must be allowed. At say 5.5° F. rise in cooling air temperature, the heat absorbing capacity of the cooling air is 92.5 B.t.u./1,000 c.f. or 5,550 B.t.u./hr./1,000 c.f.m. A temperature rise of 5.5° F. might well be taken as the minimum useful value and 5,550 B.t.u./hr./1,000 c.f.m. as a useable minimum heat absorbing capacity.

From the standpoint of the arbitrary 5.5° F. temperature rise in the cooled air before discharge from the cooled space, it is apparent from Fig. 2 that a choice of desired space temperature will substantially determine the upper limit of the tolerable outdoor wet bulb. In the example chosen, a space temperature of 78.5° F. would require a 73° F. cooled air temperature. Reference to Fig. 2 shows that 73° F. and 104 grains/lb. is at about 69.8° F. w.b.

To establish some sort of a limit condition then for 80% efficient coolers, this example gives 89° F. d.b. at 69.8° F. w.b. or practically 90° F. d.b. with 70° F. w.b. Evaporative cooling can well be considered and applied in regions where the temperature exceeds 90 F. d.b. at 70° F. w.b. or lower.

Isotherm Maps

Using isotherm maps originally appearing in "Summer Weather Data," published by the Marley Co., regions can be selected where evaporative cooling will apply with varying degrees of success. Fig. 3 shows lines of constant wet bulb for summer months on the 95% basis, i.e. temperatures shown will not be exceeded 95% of the time. The 70° F. w.b. line runs from Duluth to Fargo and down across South Dakota and Nebraska to near the eastern border of Colorado, and then through Amarillo, Roseville, and east of El Paso.

Another 70° F. w.b. isotherm loops up east of Phoenix close to Las Vegas, Nev., and then across California to San Diego. Another 70° loop lies in the central part of California. As far as wet-bulb temperatures are concerned, most of the western states are eligible for evaporative cooling units.

Fig. 4 shows a similar map of dry-bulb isotherms, again on the 95% basis. A 90° F. d.b. isotherm runs close to the Pacific Coast. Another encloses portions of Montana, Wyoming, and Idaho where dry-bulb temperatures are less than 90° F. The Arizona, California region of higher than 70° F. w.b. is seen to have dry-bulb temperatures of 100° F. to 110° F. making any cooling a benefit to comfort and energy. The central California 71° F. w.b. area is seen to lie inside a 104° F. d.b. isotherm.

As examples of the methods and results of preliminary computation of probable space conditions, the towns of Phoenix, Yuma, Sacramento, and Fresno have been chosen. Wet and dry-bulb temperatures have been taken from Figs. 3 and 4. Evaporative cooler efficiency has been assumed at 80% and a space temperature 5.5° F. higher than cooling air temperature has been used.

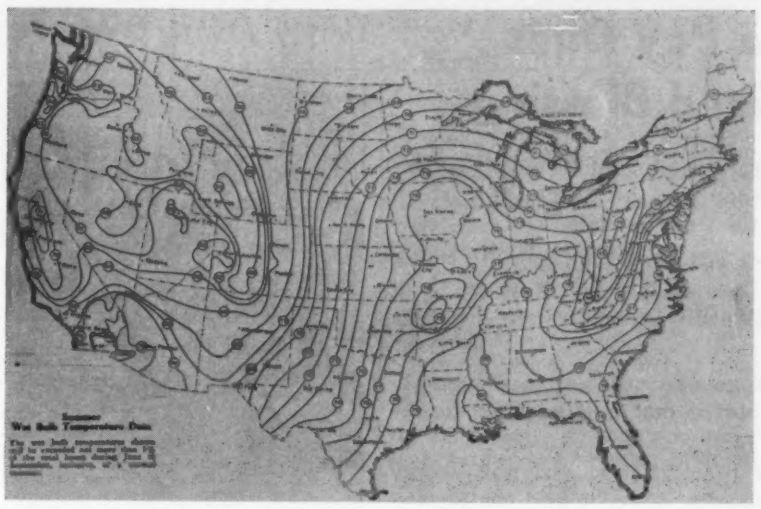


FIG. 3 shows lines of constant wet bulb for summer.

FIG. 4 indicates lines of constant dry bulb during summer.

Table 1 shows the data while the numbered points on Fig. 2 show the final conditions in each case and their relation to the comfort zone.

According to the location of points 1, 2, 3, 4 on Fig. 2, a few people in Fresno and Sacramento would be comfortable and the rest of them should feel better. The people in Phoenix and Yuma would just be less uncomfortable.

It is interesting to note that one specifier of evaporative cooling requirement calls for 15° F. temperature difference, inside to outside. On this basis, Table 1 shows acceptable indoor dry bulbs. As far as dry bulb is concerned, Phoenix and Yuma meet the 20° F. temperature difference called out for mechanical refrigeration by the same specifier.

(To Be Continued)

Table 1

Fig. 2 Ref.	City	D.B. °F.	W.B. °F.	Depression °F.	Cool Air Temp. °F.	Space Temp.
1	Phoenix	108	76	32	82.4	88
2	Yuma	110	78	32	84.4	90
3	Sacramento	100	72	28	77.6	83
4	Fresno	105	72	33	78.6	84

AIR CONDITIONING & REFRIGERATION News

Trade Mark registered U. S. Patent Office; Est. 1926.

F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

Published Every Monday by
BUSINESS NEWS PUBLISHING CO.
450 W. Fort St., Detroit 26, Mich.,
Telephone Woodward 2-0924.
New York Office: 521 Fifth Ave.,
Telephone Murray Hill 7-7158.
Chicago office: 134 S. LaSalle St.,
Telephone Franklin 2-8093.

Subscription Rates: U. S. and Possessions and Canada: $6.00 per year; 2 years, $9.00; 3 years, $12.00. All other countries: $10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents each; 50 or more copies, 20 cents each. Please send remittance with order.

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VOL. 71, NO. 14, SERIAL NO. 1,307
APRIL 5, 1954

The Right To Pay Dues Isn't An Unmixed Blessing

FIRST debate this editorialist participated in involved the thesis—"RESOLVED: A Closed Shop and the Check-Off System of collecting Union Dues Is Good for Our Country."

Instinctively (we were in grade school at the time) we chose the Negative side. And we lost the debate. Ever since then we've searched for reasonable arguments to support our juvenile contention.

At last! Here they are! Alabama's Governor (a Democrat, of course) Gordon Persons has stated our Belated Case handsomely:

"I have given a great deal of thought to the 'right-to-work' bill (H.222) which passed the House by 67 to 24 and the Senate 23 to 9.

"Mainly, this bill provides that no person shall be denied the privilege of working because he does not belong to a labor union and that no firm shall be forced to deduct union dues from the salary of the worker.

"Our labor union friends contend, and rightfully so, that unions have helped make possible better working conditions and higher wages. Because of this they feel that all employes in a unionized plant should be forced to join the union and that union dues be deducted from pay checks in what is known as the 'check-off' system. Union officials refer to those who do not desire to belong to the union as 'free riders' because such non-members obtain benefits of unions, without helping pay for such benefits.

"Along with this same line of reasoning is the fact that our churches are the greatest organizations in the world. They have done much for all mankind. Yet, no citizen is forced to belong to any church or required to pay church dues.

"Unquestionably the American Legion, the VFW, and other service organizations have done much to provide benefits to the veterans. Yet, it is not required of any veteran that he be forced to join any of the service organizations or required to pay dues to any of them.

"The Alabama Education Association is the organization which represents school teachers, and while the AEA has worked to provide for higher wages and safeguard working conditions for the teachers, those who do belong, do so of their own free will. They are not forced to join the AEA nor do they have dues deducted from their salary checks.

"Many other such examples could be given.

"Those who first settled in our great country did so because they wanted to. It has always been a tradition in America that any man could do as he pleased so long as he did not violate the laws of our land.

"In my opinion, all of our labor unions will be far stronger and the members in them will have a far greater interest and respect in the organizations if membership can be shown to be desirable and they are not forced to join.

"Because I believe in free labor and free enterprise, I am today signing the 'right-to-work' bill."

They'll Do It Every Time . . . . . Jimmy Hatlo

Thought Starters

We are not living in eternity. We have only this moment, sparkling like a star in our hand—and melting like a snowflake. Let us use it before it is too late.—MARIE BEYNON RAY.

We cannot know, do, or be everything we'd like to—but somewhere, in a personally befitting realm of endeavor, we can be "at home."—ARISTOTLE.

This is success: To be able to carry money without spending it. To be able to bear an injustice without retaliating. To be able to do one's duty even when one is not watched. To be able to keep at the job until it is finished. To be able to make use of criticism without letting it whip you.—*Royal Neighbor.*

We can only pay our debt to the past by putting the future in debt to ourselves.

"We owe to books those general benefits which come from high intellectual action. Thus, I think, we often owe to them the perception of immortality. They impart sympathetic activity to the moral power. Go with mean people, and you think life is mean. Then read Plutarch, the world is a proud place, peopled with men of positive quality, with heroes and demigods standing around us who will not let us sleep."—RALPH WALDO EMERSON.

"He hath never fed of the dainties that are bred in a book; he hath not eat paper, as it were; he hath not drunk ink; his intellect is not replenished; he is only an animal, only sensible in the duller parts."—SHAKESPEARE.

"Twice in my lifetime I have seen boys grow to men, only to be consumed by war. In the long run, a nation finds its strongest defense lines lie back in home and school, where character is built. That is what gives free peoples the power to win and to hold the right of freedom."—LORD MORAN.

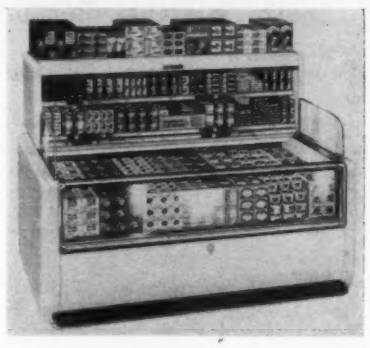
There is one man you and I will never live long enough to forget. He is the fellow who came to us the morning we tackled our first job, put his hand on our shoulder, and smiled: "My boy, you are getting along fine. Take it easy, don't get worried, and if you need any help, just call on me."—*Author Unknown.*

We have been so busy protesting what we are *against* that we have paid all too little attention to what we are *for*.—ABRAM L. SACHAR.

Commercial Refrigeration

Fast Air Circulation over Small Coil Cuts Defrost Problem In Ice Cream Cabinet

LOS ANGELES — A patented method in which air is circulated at extremely high speed over a relatively small coil and a small amount of air is by-passed into the merchandising compartment is featured in the new "Blizzard 161" ice cream merchandiser recently introduced by Weber Showcase & Fixture Co., Inc. here.



Because of the small coil on which the surface is used 100%, the defrosting problem is relatively small, the company asserted. The length of time required to return to cold temperature after defrost is also very small, it added.

"The small coil results in less metal to heat up during defrost and less metal to cool off after defrost," the company announcement said. "This results in the highest efficiency known, makes for a colder operating cabinet, and greater capacity per machine."

Sub-zero air is forced over the merchandise from the rear at high level and returns down the front flue formed by the glass package stop. Vented air spaces between the four panes of glass in the 14.6-sq. ft. front glass panel automatically adjust air pressure for different altitudes and prevent glass breakage and fogging.

The case, which will hold 756 pints of ice cream, is also equipped with a "Selectaire" cover that can be pulled forward to any of four positions to protect the merchandise from excessive heat and air without concealing it. The lightweight cover moves on precision built rollers and tracks that permit fingertip opening and closing. It is normally left open, but can be completely closed at night to reduce operating costs.

Full length lighting in the merchandise compartment as well as in the three-deck superstructure illuminates all products displayed. The superstructure offers 21.5 sq. ft. of shelf display area for non-refrigerated items.

The all-metal cabinet has a capacity of 16.3 cu. ft. and will accommodate 591 standard size frozen food packages. Occupying 21 sq. ft. of floor space, it measures 83⅞ in. long, 36 in. deep, and 60⅞ in. high, including superstructure. The reach-in opening is 14 by 75¼ in. Serving height is 40¼ in.

To protect the Dulux finish from shopping carts, the front of the case is equipped with a low level porcelain enamel bumper and a middle level highly polished stainless steel guard rail. A toe recess is provided at the bottom.

The front cover slips off for access to the automatic time control clock for setting the defrost. The entire condensing unit slides out on its own track for all-around access. The entire defrost system is accessible from the front so that it may be completely exchanged without disturbing the product or without moving the case.

Complete valve assembly, fan motor, and drier are also in one compartment where they are easily accessible.

The cabinet operates on 230-volt, 60-cycle, single phase current. Lights operate on 115-volt, 60-cycle, single phase current.

McCray Names Distributors In Kansas, Okla., Wash., N. Y.

KENDALLVILLE, Ind. — The McCray Refrigerator Co., Inc. here announces the appointment of four new distributor organizations to handle its line of commercial refrigeration and home freezers.

Al Fromholtz has organized the Colby Refrigeration Co. in Colby, Kans. to handle the sale of McCray products in 12 surrounding counties.

Monroe Food Machinery, Inc., Spokane, Wash., will distribute McCray equipment in 15 counties in the state of Washington, nine counties in Idaho, and the state of Montana west of the Continental Divide.

Sol Rauch will sell McCray products, through his Gotham Equipment Corp. of New York City, in six counties in the state of New York including Manhattan.

Virgil H. Greene and his son, Virgil, Jr., operating as the Virgil Greene Co., Oklahoma City, will distribute for McCray in the 37 counties that make up most of the western half of the state.

U. S. Grant Firm Represents Jordon In Calif., Ariz., Nev.

LOS ANGELES—U. S. Grant and Associates here have been appointed representatives of the Jordon Sales Co. Their territory will include California, Arizona, and Nevada.

NCRSA To Hold Convention In New York City, Nov. 8-9

PHILADELPHIA—The National Commercial Refrigerator Sales Association has decided to hold its eighth annual convention in the Hotel Statler, New York City, on Nov. 8 and 9, 1954.

The association is considering whether to increase the convention to four half-day sessions rather than three as has been the practice in the past, according to Marie Lawton, executive secretary.

The Commercial Refrigeration Distributing Association of metropolitan New York has extended an invitation to the convention to be its guests at a reception on Monday evening, Nov. 8, preceding the association's annual dinner.

Green Bay Firm Becomes Northland Refrigeration Co.

GREEN BAY, Wis.—Following a decision to work principally with air conditioning and refrigeration, the Grocers Equipment Service Co. has changed its name to Northland Refrigeration Co., it was announced here recently.

The firm, which handles the Hussmann and Frigidaire lines of commercial refrigeration equipment and Frigidaire industrial refrigeration and air conditioning equipment, is headed by Lee Joannes as president.

USDA Plans Research on Freezing Bakery Items

WASHINGTON, D. C. — Research to find out the best way of freezing bread and other bakery products for storage in home freezers is planned by the Department of Agriculture, agency officials reported recently to a House Appropriations Subcommittee.

Object of the study is to help the bakery industry increase its sales, they explained.

The subcommittee was told that the industry has been adversely affected by consumers' tendency to purchase a week's supply of groceries at one time in supermarkets.

The industry's worst problem, "staling," can be avoided if bakery products are frozen, it was pointed out. However, not enough information is available on the proper temperatures for freezing bread, pies, and cakes, according to the USDA officials, who also called attention to the growing number of consumers who own home freezers.

The officials informed the subcommittee that some of a requested $200,000 increase in funds for cereal research in fiscal 1955 would be used to help solve bakery industry problems.

MORE INFORMATION?
Use Handy Coupon on "What's New" Page

What's New

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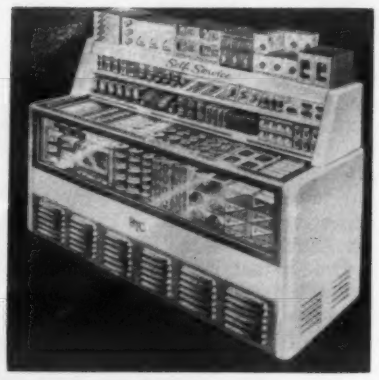
BTC Ice Cream Cabinet Defrosts In 6 Minutes



——KEY NO. D-410——

MT. VERNON, N. Y.—A new ice cream and frozen food cabinet that defrosts automatically within six minutes every four hours—claimed to be the "fastest defrost cycle on record"—has been announced by The Brewer Titchener Corp., Refrigeration Sales, here.

The 15-cu. ft. cabinet was engineered primarily for ice cream.

"Tests showed," the company said, "that ice cream, the most temperature-sensitive product of all, will not soften during the speedy defrosting process on the new BTC SS 75 AD. This cabinet was engineered to assure constant frozen-hard solidity to ice cream."

The SS 75 AD features a superstructure that affords 13 sq. ft. of extra selling display space to stimulate impulse sales. (This same cabinet is available without superstructure, model no. 75 AD).

No plumbing is required. Automatic water evaporation removes all moisture resulting from the defrost operation and prevents accumulation of water or dripping.

The cabinet is said to offer "greater glass front visibility." The cabinet is designed so that the entire system with all component parts is accessible from the front for simplified servicing. Complete-coverage illumination provides full lighting for all merchandise.

The BTC SS 75 AD is 75½ in. long and 33 in. deep. Height with superstructure is 54 in. It is powered by a 1-hp. hermetically-sealed condensing unit for "F-22." It affords an ice cream capacity of 735 square pints or 378 quarts or 180 half-gallons.

Adhesive Gun Applies Light, Heavy Compounds

——KEY NO. D-411——

MINNEAPOLIS—A new pistol-type adhesive gun has been developed by Plews Oiler Co. here for use with both light and heavy compounds.

The new adhesive gun gives a steady, even flow of compound to install glass in all types of construction; caulk joints and seams; and seal the edges around plumbing fixtures or around tile installations.

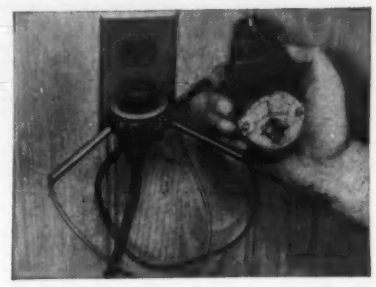
Available in both 6-oz. and pint containers, the gun has a 5-in. rigid, seamless spout with detachable adhesive nozzle. It is constructed of heavy gauge steel, and nickel plated to stand up under heavy use.

The spout, nozzle, and pump are designed so that they can be completely dismantled for easy cleaning.

A new seamless spout has been developed for all models to replace the soldered seam type previously used. A leak-proof coupling for use on all oilers with interchangeable spouts has been designed, and the method of attaching a fixed-type spout to the container has been improved. All models are made with one piece drawn steel base.

A four-page brochure containing illustrations and specifications of the entire line of new and improved Plews Oilers is available.

CHECKING appliance current at receptacle.



CHECKING appliance voltage at receptacle.

Energizer Helps Measure Voltage at Line Outlet

——KEY NO. D-412——

LYNBROOK, N. Y. — A new Amprobe Energizer Model A-40, an accessory which makes possible instant current and voltage readings at the wall outlet when used in conjunction with a snap-around volt-ammeter, was introduced recently by Pyramid Instrument Corp.

It provides receptacles for measuring line voltage at the outlet—under actual load conditions, while the appliance is connected to the line. Heavy duty construction increases the capacity to 25 amps for direct readings, and 10 amps for 10x sensitivity readings.

The new Amprobe Energizer performs three functions which make electrical checks easier. It serves as a "split" plug to divide double-conductor line cords at the outlet for a quick snap-around ammeter reading, the firm says.

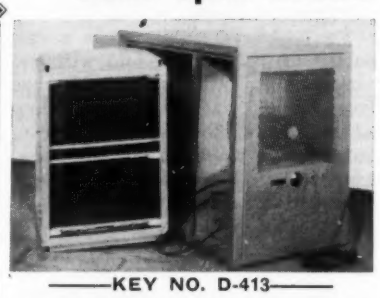
It can increase split core ammeter sensitivity by 10 times for precise readings on small appliances and fractional horsepower motors. And now it also makes it possible to measure line voltage at the outlet while the appliance is connected to the line.

The Amprobe Energizer is first plugged directly into the ordinary outlet receptacle. Then the motor or appliance line cord is plugged into one of two current-reading positions: Direct Ampere Reading or 10x Sensitivity.

The current reading is taken by snapping the jaws of the Amprobe snap-around volt-ammeter through the Energizer ring. Voltage readings are, of course, taken by plugging the voltage test leads into voltage receptacles on the Energizer.

It is priced at $3.75.

Baker 'Space Cleaner' Uses Electrostatic Unit



——KEY NO. D-413——

MAPLEWOOD, Me.—The Baker Co. here has announced a new "Sterilshield Space Cleaner" for any location where it is desired to lower the dust, smoke, pollen, or bacteria content of the air.

The unit makes use of a 1,000-c.f.m.-capacity electrostatic air cleaner, with its associated power supply. A propeller fan drives air through the unit horizontally from one end to the other. It is mounted on casters for easy portability, and is 33 in. long, 32 in. high, and 21 in. wide.

The dust collector cell can be easily removed from its compartment and cleaned by means of running water.

Price is $495 F.O.B. Maplewood.

Information Center

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(list name, page, and issue date)

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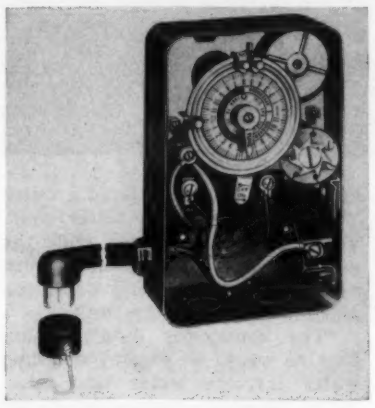
What's New (Con't)



Plug-In Time Switches Control Room Conditioners

——KEY NO. D-414——

CHICAGO — Portable plug-in time switches designed especially for automatic control of room air conditioners were recently added to the "Inter-Matic Time Switch" line manufactured by International Register Co. here.

Known as Series P690, the new switches will control automatically any ⅓, ½, ¾, or 1-hp. room air conditioner.

Series P690 time switches are equipped with a 4-ft., 14-gage, 3-wire, type "S" cord set with moulded-rubber, three-way, grounded male plug.

There are two models available. Model P691 is for 125-volt operation. The cord set is equipped with an adapter plug so it can be used on either a 2-wire or 3-wire electrical system. A three-way universal receptacle is mounted on the right side.

Model P692 is for 250-volt, 3-wire electrical systems. It has a standard 3-way receptacle.

Series P690 switches incorporate the Inter-Matic "skipping" device which permits skipping the automatic operation of the time switch on Saturdays, Sundays, holidays, or other selected days of the week.

Other features: Up to 11 on-off operations per day; timing range —one to 23 hours; approved by Underwriters Laboratories.

Complete details are contained in catalog NR14.

Mobile Undercarriages Added to Thor Washers

——KEY NO. D-415——

CHICAGO — Thor Corp. announces the "Stow-A-Way" undercarriage for Thor automatic and "Spinnermatic" washers. The new undercarriage makes Thor washers mobile, allowing the homemaker to roll the washer away into a closet or any storage space.

The new Stow-A-Way is operated by a handle, using the lever principle, which raises or lowers either rubber-based legs for operation, or ball-bearing casters for movability.

The operating handle, located out-of-sight at the rear of the machine to eliminate widening the washer, allows the homemaker to stow it away in the same narrow space she may now use.

The new undercarriage does not alter the level of Thor machines. Height remains the same whether the washer is on legs for operation or on casters for Stow-A-Way.

Casters have ball-bearing operation both in the wheels and at the swivel, making for smooth, no-jamming action, the company said.

Mueller Dehumidifier Has 'Horizontal Coil'

——KEY NO. D-416——

MILWAUKEE—A new dehumidifier featuring "a new idea of horizontal coil arrangement" has been announced by Mueller Climatrol here.

The compact unit will remove up to 24 pints of water from the air in 24 hours, depending upon humidity conditions, according to the company.

"Unlike horizontal blow-through type dehumidifiers, the Mueller unit pulls in moisture-laden air from all directions at the bottom of the unit and dispels dry air through a diffuser vent on the top.

"The unique design of this unit, with a new idea of horizontal rather than vertical coil arrangement, increases the dehumidifier's efficiency. Contrasted to vertical coils, the condensate moisture rolls off this type of coil faster."

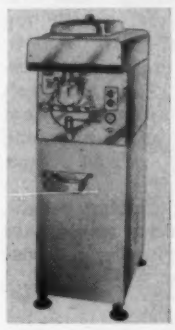
Other features of the unit include: A large reserve capacity; hermetically-sealed ⅙-hp. compressor; sealed, permanently-lubricated motor; casters for easy mobility and an off-on toggle switch—both standard equipment; and a 10-qt., turned-plate condensate collector.

The dehumidifier is also "adaptable" for automatic drainage.

Shake Dispenser Model Produces 360 Per Hour

——KEY NO. D-417——

CHICAGO—Addition of the new Freez-King Shake Dispenser model 800 to its line of soft ice cream freezers has been announced by Freez-King Corp. here.



The company said the freezer "should prove an effective and profitable installation in drive-ins and at fountains where speedy dispensing of malts and shakes is necessary." It is claimed that the dispenser can produce as many as 360 shakes an hour.

The equipment is compact, occupying only 20 in. by 26 in. of floor space, according to the company, and has a stainless steel front and highly-polished nickel silver metal castings. Other mechanical features include the "seeing eye" dial which tells at a glance if product is at the proper serving consistency and when freezer is properly loaded, and automatic temperature control.

The maker asserts that the Freez-King shake dispenser will do away with ice cream scooping and other time and labor-consuming chores.

'Rist-Acid' Useful as Finish for Refrigeration

——KEY NO. D-418——

CLEVELAND—Development of a new "extremely high corrosion-resistant" finish for use by the refrigeration and air conditioning industry was announced recently by Excelsior Varnish Works, Inc.

Called "Rist-Acid," the finish is also resistant to mineral acids and alkalies in almost any concentration at normal temperatures, according to the company.

Some of the places where there is a need for such a finish, the company said, are in cooling towers where water actually strikes the fan blades; blower wheels and housings; the internal case of the cooled air sections; and the external case of window units (as an undercoat).

"Any place within the unit where potential corrosion would be dangerous, such as the evaporative or condenser coils, will benefit from the use of this finish," the manufacturer stated.

"The ease of application of Rist-Acid will let it conform to present setups. No special surface preparation is necessary other than normal degreasing. It is non-toxic. Rist-Acid can be brushed, sprayed, or dipped, air dry or baked."

The company said the finish has passed the standard ASTM salt spray test for 70 hours. It added: "Actually, over 100 hours in test showed no corrosion present."

How New Plumbing Code Affects Contractors; Inspector Says Detailed 'Specs' Would Help

DETROIT—Recent violations of plumbing regulations by local refrigeration contractors and the adoption of a new plumbing code have prompted two Detroit city officials to review rights and limitations of contractors with respect to plumbing.

They believe, further, that these regulations are of national interest because Detroit operates under the ASA-B9 refrigeration safety code and the new plumbing code, which goes into effect April 2, is substantially the recommended national plumbing code which is sponsored by several interested groups.

'Points of Confusion'

"Main points of confusion" in the air conditioning and refrigeration industry, according to one official, are (1) how much piping such contractors can legally install, and (2) not realizing the the dangers of contaminating potable water through improper plumbing.

In Detroit no plumbing permit is required for the repair or replacement of less than 10 ft. of water or drain piping, point out both Frank Drogosch, chief safety engineer (responsible for administration of the refrigeration code), and L. Glen Shields, chief of the city's Bureau of Plumbing.

"We interpret this to mean that a refrigeration or air conditioning contractor can install up to 10 ft. of piping without taking out a permit," Shields says. "And we aren't supposed to worry about what might be included in the plumbing within that 10 ft., such as pumps, etc.," he adds.

To take out a plumbing permit, of course, a contractor would have to hold a master plumber's license issued by the state.

Limit Is 10 Ft.

"Our interpretation of the 10-ft. point is consistent with the national plumbing code, although the distance of 10 ft. is not mentioned specifically in the code," Shields declares.

Shields, incidentally, was president of the American Society of Sanitary Engineering at the time this group and others were working up the national plumbing code.

"We don't want to work any hardship on anyone. We want to be reasonable," he hastens to add. "We know that the quickest way to get a code thrown out is by unreasonable enforcement."

Sympathy with refrigeration contractors was voiced by Shields, however, because sometimes, he said, they are left to the mercy of plumbers by architects and layout engineers.

"An architect's specifications," he contends, "should be drawn up in detail so that the plumbing contractor brings the plumbing and drain connections to within 10 ft. of the connections on the refrigeration or air conditioning unit.

"What often happens," he says, "is that the plumbing contractor will bring the piping and drains to the side of the room where the refrigeration equipment is to be installed. The room may be large, and there may be considerably more than 10 ft. between the piping and the equipment. Then the refrigeration contractor has to pay through the nose to have a plumber run that extra piping. If the specifications had been drawn up right in the first place, this wouldn't happen.

Trades Will Go Along

"I also believe that various trades involved will go along with the 10-ft. distance as it concerns jurisdiction," Shields added.

"We had something of a similar problem years ago with furnace humidifiers," he continued. "To install these a furnace man would simply drill a hole in a convenient water pipe and make a saddle connection. If it were copper piping, some installers merely drove a spike into the copper pipe to make the hole. In either case, we received a lot of complaints about leaks.

"We went to builders and arranged with them to have the plumber install valved off connections within 10 ft. of the furnace so that these humidifiers could be installed properly."

Dangers of Cross-Connection

Regarding the possible contamination of drinking water, Shields points out the dangers of "cross-connecting" supply and waste systems.

"After all, no one runs water piping through a sewer," he says and goes on to explain that cross-connecting can be just as bad.

The term is officially defined in the new Detroit plumbing code (in Section 211) as follows:

"A cross connection or interconnection is any physical connection between a city water supply and any waste pipe, soil pipe, sewer, drain, or any private or uncertified water supply. Furthermore, it is any potable water supply outlet which is submerged or can be submerged in waste water, and/or any other source of contamination."

Such cross connections are prohibited in the national plumbing code and the Detroit code. Shields explains what can happen, and actually has on numerous occasions, he says, if cross connections exist:

"If a water main should break, or the water system be opened for repair, the water pressure is reduced or drops to nothing. With cross connections, reverse flow and back siphoning can then take place. This will pull sewage or contaminated water into the water system. Severe epidemics have been the result.

1,500 Stricken

"Perhaps the worst on record from this cause occurred in Chicago in 1933 when some 1,500 were stricken with amoebic dysentery, 98 of whom died."

For this reason piping to dispose of condenser water from cooling systems cannot be physically connected to the drainage system but must discharge into an open basin, he said.

Shields also cited a recent job in Detroit where a refrigeration contractor was asked to modernize an old ammonia drinking water chiller system.

"The contractor proposed installation of a 'Freon' coil and a water coil in a large open water tank. The 'Freon' coil would chill the water in the tank which in turn would chill the drinking water coil also submerged in the tank.

"The contractor didn't realize that he would be passing drinking water through water that could easily become contaminated because it was in an open tank. Any leak that might develop in the water coil could pull contaminated water from the tank into the drinking water system," Shields explained. "Naturally, the plumbing inspector wouldn't approve such a hookup."

Sections of New Code

Pertinent sections of the new Detroit plumbing code are as follows:

Section 703. **Definition of Secondary Water Supplies.** Secondary water supplies shall include: water from any other source than the city supply: surface waters from rivers, lakes, ponds, lagoons, and reservoirs; well waters both deep and shallow; city water which has in any way been treated, processed, or exposed to any possible contamination of a bacterial or chemical nature and then stored or transmitted for reuse; recirculated processing or cooling water.

Section 704. **Cross-Connections Prohibited.** No physical connection shall be maintained between pipes carrying city water and pipes, tanks, or equipment supplied from any other source. Where dual supplies are necessary or desired, pipes carrying city water must be protected against backflow of polluted water by an atmospheric gap of at least twice the diameter of the city water supply pipe or orifice above the maximum possible high-water level of the receiving tank or equipment, except that an alternate method for affording protection to the city supply lines may be employed with the written approval of the Department of Health and the Department of Buildings and Safety Engineering.

Section 704.1. **Connection With Underground Storage Tanks.** Any connection between water pipes receiving their supply through city water mains or other approved source, and pipes from underground storage tanks or any unapproved source, is expressly forbidden.

Section 704.2 **Connection to Soil, Waste, Fixtures and Devices.** Cross-connections or inter-connections between the potable water distribution system and any portion of the waste or soil system, or with fixtures and/or devices whose usage may contaminate, pollute, or otherwise render unfit for drinking or culinary purposes the water used therein, shall be prohibited, except that those fixtures or devices, whose proper functioning will not permit an air gap adequate to prevent back-siphonage, shall be equipped with vacuum breakers, back flow preventers, and/or other safety devices which are acceptable to the Department of Buildings and Safety Engineering. (See Section 709).

Section 805.1. **Submerged Piping Prohibited.** No water distribution piping on the pressure side of the air gap, backflow preventer, or vacuum breaker shall be installed so any part thereof may be submerged in sewage, waste water, impounded water, or other liquid.

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DEFROSTING system and other features of McCray low temperature open case are inspected at Central States Refrigeration Service Clinic.

Design, Operation, Servicing of Hot-Gas Defrosting In Frozen Food Cases Outlined

CHICAGO—Problems in design, operation, and servicing of hot-gas defrosting systems used in open-type frozen food display cases were outlined by Don Taft, service manager of McCray Refrigerator Co., Inc., at the Central States Refrigeration Service Clinic here.

"Originally low temperature self-service cases had plate dividers and required frequent defrosting," Taft reminded the servicemen. "Normally there were caps on the plates. The caps were removed, the food taken out of the case, and the frost flushed off the plates with water.

"These cases were satisfactory from the refrigeration operational viewpoint, but store owners wanted automatic defrosting and wanted to use the space taken up by the dividers. Also, they wanted the throat of the case opened up to get more and higher display. In addition, they thought that frost on the plates was unsightly," Taft said.

AUTOMATIC DEFROSTING

"To meet these requirements forced convection cases with automatic defrosting were introduced. All methods of defrosting cases—hot gas, water, or electric heaters—have both good points and bad. At McCray we use the hot-gas method.

"It is necessary to defrost the coils fast to prevent warming up of the product on display in the case. We use a timer to start the defrost cycle, but a special thermostat responding to the coil temperature turns the unit back on the cooling cycle.

"Additional protection is provided, however, in the event the thermostat fails to return the system to cooling. The timer clock is so set that after a predetermined period of time it will turn the system back on cooling regardless of the thermostat.

"The timer clock," Taft continued, "can be wired to operate 24 hours according to the time of day or to run only when the compressor operates. The customer, however, prefers to have the defrost cycle come on at the same times every day, preferably when the store is closed. Thus, the clock is usually set to run all the time."

Questioned as to what would happen if the timer clock should call for defrost when the refrigeration unit isn't running, Taft explained that "almost as soon as hot gas hits the coil, the temperature of the coil will rise and the case thermostat will cut in the unit."

SHOULD LINE BE INSULATED?

Should the hot-gas line be insulated? he was also asked.

"That's a controversial subject. We think, however, that because the hot-gas line is used for only a short period of time, it isn't necessary. Insulation would eat up a lot of heat from the hot gas and prolong the defrost cycle. So we advise not to insulate it except where it passes through cold rooms or comes in close contact with other refrigerant lines."

Another questioner wondered whether there was ever any difficulty with flare nuts loosening, especially at the expansion valve, due to hot gas causing rapid expansion of the metal followed by quick contraction at the start of the cooling cycle.

"We've had no problem on our equipment," Taft said.

Operation, Servicing of Automatic Ice Makers Demonstrated

Ajax Representative Uses Model To Explain Principles At Central States Clinic

WORKING model of ice cube maker intrigues servicemen at Service Clinic. R. E. Niedermeier, Ajax service manager (upper right), explains details.

CHICAGO—Principles of operation and some of the service problems encountered on Ajax automatic ice cube makers were outlined at the Central States Refrigeration Service Clinic here by R. E. Niedermeier, general service manager for Ajax Corp. of America.

OPERATING MODEL USED

Using an operating model with panels removed, Niedermeier explained and demonstrated the numerous mechanical, electrical, and refrigeration components of one of the Ajax machines.

In this model, he showed, ice cubes are frozen in an ice tray which makes 132 cubes per cycle. In effect, the tray is upside down, a platen assembly automatically elevating to form and seal the bottom of the tray during freezing. The platen drops down at an angle during the harvest cycle.

When the ice cubes are frozen and the temperature of a thermostatic bulb feeling the temperature of the ice cube tray drops to about 17° F., a control starts the hot-gas cycle to free the cubes from the tray and the platen swings down to form a ramp or chute at an angle of about 45°. Cubes drop from the evaporator and are deflected by the platen into the adjoining bin.

Five quarts of water are required per freezing cycle, four of these being frozen into cubes.

WATER AGITATED

To keep the ice cubes as clear as possible, Neidermeier explained, there is a perforated flat plate in the platen assembly that agitates the water constantly as it freezes. Agitator plate is driven by a separate motor through a Scotch yoke arrangement. This motor operates all the time, regardless of the machine's cycle.

Complaints of incomplete freezing on this machine, he indicated, could be the result of a restriction in the liquid line which would reduce the flow of refrigerant to the evaporator, or shortage of refrigerant in the system, or improper superheat setting of the thermostatic expansion valve.

Checking the refrigerant charge can be something of a problem, Neidermeier admitted.

"Some models, however, have a test cock mounted on the receiver.

"At 15 to 20 p.s.i. suction pressure, you should get liquid out of the test cock if the charge is sufficient. Be sure to use a gauge in making this check," he advised the servicemen.

Air Conditioning Can Cut Plate Making And Press Room Operating Costs For Lithographic Printers

DALLAS — Spokesmen for both the air conditioning manufacturing and printing material industries recently advised the Printing Craftsmen's Convention here that air conditioning has proved valuable in solving many of the production problems in fine-register, multi-color lithograph printing.

Dr. Paul J. Hartsuch, lithographic consultant with the Printing Ink Div. of the Interchemical Corp., defined sufficient air conditioning as "automatically controlling air at 75 to 80° F. with relative humidity of 45 to 50%."

He also added that the concept includes the addition of moisture to air during the dry months as well as refrigeration and humidity control during the summer.

SAVINGS IN PLATE MAKING

Dr. Hartsuch observed: "The variation of moisture in light-sensitive coatings is the source of most plate-making troubles experienced in hot, humid weather. It can account for plate scumming on the press, as well as for some image areas failing to take ink in deep etch plates. The best answer is air conditioning.

"With controlled temperature and humidity, a plate department can set up standard procedures for whirling, exposures, developing, and etching. More uniform, higher-quality plates can be produced in less time."

PRESS ROOM PROBLEMS

Dr. Hartsuch also said that in the press room air conditioning is important because it permits more predictable ink drying, and eliminates many paper troubles such as wrinkles and change of dimensions on successive multi-color runs. Static electricity also can be reduced by proper humidity control. And the comfort of employes is an important factor in air conditioning.

Representing the air conditioning industry, Ralph A. Gonzales of Chrysler Airtemp observed that fine-register, multi-color offset lithography has the most exacting requirements in regard to humidity.

"The press room relative humidity range usually is given as 46 to 48%, with the stock storage room 5 to 8% above the press room.

Gonzales reported that many printing plants are obtaining excellent production results from the installation of standard human comfort air conditioning systems to handle the summer problems.

"The humidity control maintained by these systems—while perhaps not entirely within the bounds envisioned by the paper and technical printing man—is a major improvement over previous conditions," he said.

EXACT CONTROL AND COMFORT COOLING COSTS COMPARED

For the purpose of general comparisons, Gonzales estimated that year-round air conditioning, with exact temperature-humidity maintenance controls, will cost approximately $4 per sq. ft. for the average shop.

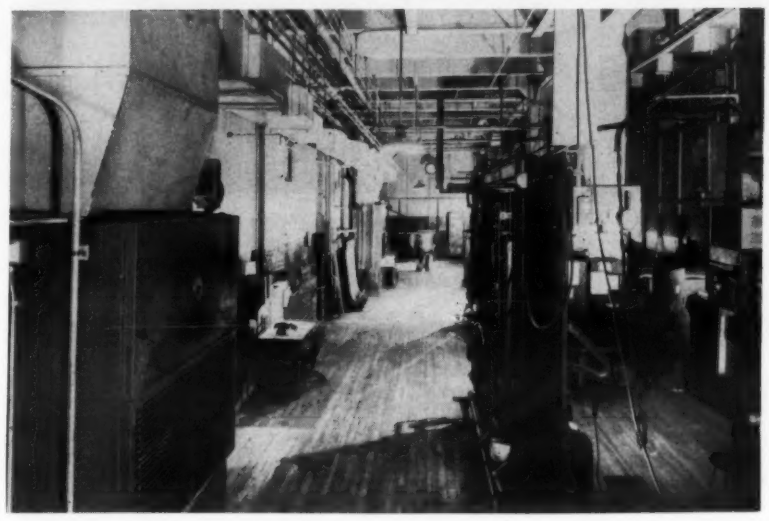
On the same basis, air conditioning installed primarily for human comfort will average $2 per sq. ft. of floor space.

"Two authorities influence the work of the air conditioning engineer in the printing plant: the technical expert on paper and printing, and the business operator of the printing establishment.

"I would like to suggest that enough businessmen have made successful, quality-improving investments in less than maximum controlled air conditioning systems to warrant a careful look and consideration of the problem on the part of the persons concerned with the technical recommendations," he said.

"Another very important consideration is the fact that the shop

AIR CONDITIONING



COMPOSING ROOM of the Forbes Lithographing Co., Boston, is equipped with two 15-hp. packaged air conditioners to maintain ideal conditions in producing perfect photographic plates for use in fine-register, multi-color reproduction.

that installs the packaged type of air conditioning as a first step, can at a later date add the necessary equipment and controls to provide closer temperature-humidity control when such additional investment is warranted."

A typical packaged installation is illustrated by the composing room of the Forbes Lithographing Co., Boston, one of the nation's oldest lithographers.

According to the Forbes Co., air conditioning has proven its worth by maintaining ideal conditions in the composing room for the correct rate of drying to produce perfect photographic plates for use in fine-register, multi-color reproduction.

Two 15-hp. Chrysler Airtemp packaged air conditioners with a room-long air distribution system have been installed alongside the wall. The units are equipped with re-heat coils and humidifiers for accurate year-round control.

Few room alterations were necessary. A suitably sized cooling tower with water circulating system was included in the installation. Cost was just over $4 per sq. ft. of floor area for the installation, including the water tower.

Atlanta Concern's New Bldg. Completely Air Conditioned

ATLANTA—J. J. Finnigan Co., local steel fabricating concern, has occupied its newly-completed general office building here which is completely air conditioned.

William J. McAlpin, president, said the two-level building, with approximately 8,000 sq. ft. of floor space and designed for later additions, is one of the most modern structures of its type in this area.

Lipman Ice Cube Maker Allows For 'Positive Control' of Sizes

BELOIT, Wis. — An ice cube maker that "affords positive control for cube sizes" has been designed by Lipman Refrigeration Div. of Yates-American Machine Co. here.

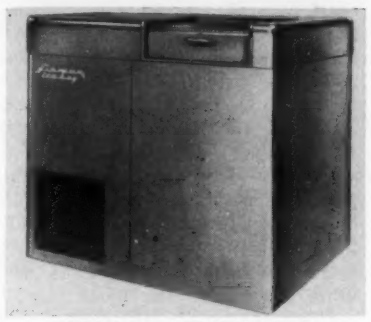
Especially engineered for "King Size" ice tips, the new LC-40 Lipman "Iceboy" is described as "an economy unit for commercial installations—just one of its extra-large tips being sufficient to effectively cool a drink."

"The Lipman engineers have combined the most desirable features of previous Lipman Iceboy models into the LC-40, as well as adding the first positive mechanical control for size of the ice tip," the company said.

"Any size tip may be frozen up to 1¾ in. in diameter (standard length of the tip is 2¾ in.). The size of the tip is not affected by variable conditions such as temperature and pressure.

"When the tip grows to the predetermined size, a microswitch cuts off the freezing cycle and puts the unit on defrost—which is rigidly controlled by a time clock. An adjusting screw provides easy setting of the control arm for any desired tip size, with all tip sizes consistent for any one batch.

"The new LC-40 makes 1,000 to 1,700 'King Size' tips per day under normal operating conditions, depending on the size tip desired, and stores over 900 tips at one time.



LIPMAN model LC-40 "Iceboy."

"The tips have no flat surfaces and will not stick together in storage. Tips are shaped for maximum cooling power—cylinder-shaped and round at both ends.

"The new model has only one moving part—the revolving paddle which keeps the water in circulation and insures fresh, clear tips, plus also removing the finished tips from the freezing tank into the storage bin."

Of 18-gauge steel, the cabinet is 35 in. high, 38 in. long, and 26½ in. deep, and is finished in "Hammertone Avalon Gray." Other features include automatic shut-off and stainless steel storage bin.

Commercial Refrigeration

Automatic Ice Cream Freezer Can Make It Worthwhile To Run a Soda Fountain

BUFFALO—"The automatic freezer enables you to depart from grandma's old-fashioned methods and meet today's demands for a product of higher quality, faster service, and lower food and labor costs. Those things can be accomplished to the point where it is very much worthwhile to run a soda fountain again."

So said Harvey F. Swenson, president of Sweden Freezer Mfg. Co., in addressing the annual convention of the National Association of Retail Ice Cream Manufacturers.

"Today's fountain girl doesn't dress like grandma did, she doesn't read by a kerosene lamp, or drive a horse and buggy, but she makes ice cream sundaes and other fountain dishes just like grandma did 50 years ago," he asserted.

"Although fountain equipment has changed, methods have not, and most fountains are still operating the same as in grandma's day and are hand-dipping ice cream to make fountain dishes."

Swenson pointed out that modern soft-serve freezers make possible an automatic fountain system of operation.

He stressed its worth by declaring that food costs are reduced 40 to 60% by the automatic fountain method and that labor costs are cut 40 to 75%, with preparation time reduced almost 60% by a system that eliminates hand-dipping of ice cream.

Sale of packaged ice cream for the "take-home" trade should be pushed, Swenson urged, but he stressed the important savings realized in labor and food costs when all fountain dishes are made with the firm, but soft product from fountain freezers.

He pointed out that the automatic "Frigidmixer" turns out a milk shake that is ready for serving, except for the addition of flavoring and the second or two of spinning that is required for mixing.

Swenson said the food cost for a 25-cent shake made by the automatic fountain method is 6 cents, instead of the 13.5 cents of the old, hand-dipping method, which means a gross profit of 19 cents per shake under the new system.

"One of the most important features of the automatic fountain is that it is a 'hands-free' operation," Swenson said. "This means that fountain clerks can hold containers in both hands, operating the freezer by a foot switch."

He added: "Portion control is important, too, from the standpoint of uniform servings and costs, and measured portions may be served automatically by electronic controls."

In the actual operation of an automatic fountain system, Swenson stressed the importance of a reliable source of mix that does not vary, but has a uniform freezing temperature that may be depended upon to be the same from day-to-day.

To make certain the uniformity of mix does not change, he suggested checking it against its freezing temperature. Swenson also said a good canned mix may be used as the standard against which to check dairy mixes to determine uniformity.

"A very important point to remember when planning your fountain is the consultation of a qualified fountain engineer," Swenson said. "Remember, you are not installing just a piece of equipment, but a system of operation that should do a specific job for you, and errors in setting up a fountain can be costly."

'Experimental' Supermarket Designed To Cut Construction, Operating Expenses

PHILADELPHIA — Stock storage and workroom areas along the sides and rear of the store will be one of the features of an experimental supermarket to be built on the Concord Turnpike, just west of Wilmington, Del., for American Stores Co.

These and other facilities are designed to speed up merchandise handling and storage. It is believed that the new system will reduce initial construction costs nearly 20% and cut operating expenses "substantially."

The stock storage and work areas will be about 14 ft. wide at the sides of the market and 20 ft. wide at the rear, and have low (10-ft.) ceilings, it was reported. Display cases will separate these areas from the higher-ceiling selling area, with drop walls between the two ceiling levels.

One of the advantages cited for this arrangement is that it will reduce costs of installing equipment by permitting placement of compressors for refrigerated cases anywhere along the sides or rear of the market.

The layout also will allow use of lower-cost materials for interior finish, eliminate the need for many of the interior finish materials now used (since display cases will serve as walls between service and selling areas), provide more space for stock storage, and permit separation of preparation areas and delivery docks for meat, dairy, and produce items.

New locations (compared with present Acme units) are planned for dairy, baked goods, and other departments to achieve an easier flow of traffic. Also, the meat department will be redesigned to establish better facilities for storage and cutting.

The market will be located slightly off the center of an 80,000-sq. ft. parking lot capable of handling 280 cars. Customers will be able to approach the store from three sides and park their cars along a 10-ft. sidewalk shielded by a stainless steel canopy around the building.

The canopied areas will not only afford protection from inclement weather but are expected to reduce the cost of carry-out service. It was explained that customers can push their own carts to their cars and, after unloading their purchases, leave the carts at stations which have been located along the walks.

As now planned, the market will have an over-all area of 21,033 sq. ft., of which about 15,000 ft. will be devoted to selling space. Cost of construction was estimated at $250,000 by J. & G. Daverman Co. and Kenneth C. Welch Associates, the designers.

Stressing that the market will be constructed "purely in the nature of an experiment," Huston Rawls, president of National Planning & Research, Inc., which is handling plans for the store for Acme, said future developments "will depend largely on customer response to the new structure."

Refrigeration Problems

and their solution

by Paul Reed

For Service and Installation Engineers

Paul Reed

Cold Weather Problems (6)

In the previous instalment we discussed what happens when an air-cooled condensing unit is located in a basement at 40° and the cooler, held at about 38°, is located in the store above that is kept at comfortable temperatures of around 70° to 75°.

With such a cool location, we found that the head pressure would be very low and that short cycling and expansion valve trouble were likely, and that it might be difficult to maintain desirable temperature and humidity conditions in the refrigerator.

BASEMENT AT 30°

Now, suppose that the basement temperature drops to 30° or lower. First, of course, the head pressure will drop even lower than it was at 40°. With a 30° basement, the head pressure, while the unit is running, is about 60 to 70 p.s.i.g. This will increase the likelihood of expansion valve trouble, for the pressure drop across the valve is even less—probably only 30 or 40 p.s.i.g., consequently reducing the capacity of the valve.

The lower head pressure will also increase the capacity of the condensing unit, thus increasing the tendency toward short-cycling and making it even more difficult to maintain proper temperature and humidity conditions in the cooler.

But with the basement at 30°, the difficulties are not just a little greater than at 40°; they are a great deal worse. It will be difficult to get the unit to operate at all, and if we do, the compressor is apt to be damaged.

A NORMAL DEFROST CYCLE

The following outlines the temperatures of the coil during a normal off cycle of the blower coil, with the condensing unit controlled by a low pressure control set to cut in at 37 p.s.i.g. and cut out at 22 p.s.i.g. to give a self defrosting cycle.

In our example, the store is at 70° to 75° and the cooler is at 38°, so heat leaks through the walls of the cooler, and more heat enters the cooler as the door is occasionally opened. The air in the cooler is circulated by the blower fan and carries the heat to the blower coil.

During the previous run, the coil temperature averaged about 25°, but by the end of the run it was down to 22° and the suction pressure was down to 22 p.s.i.g. at which the low pressure control was set to cut out and stop the compressor.

As the 38° air is blown over the coil, the coil gradually warms up and the frost that accumulated on the coil during the running cycle gradually melts off. As the coil temperature rises, the pressure within the coil also rises.

The coil does not stay at the same temperature throughout the coil, however. Liquid refrigerant and oil left in the coil at the end of the run tend to gather in the lower passes of the coil, leaving only gaseous refrigerant in the top passes of the coil.

Therefore, these top passes of the coil warm up more rapidly than the rest of the coil, for the liquid refrigerant and oil have more heat capacity and thus warm up more slowly. The frost starts to melt on the top passes first. Some of the water is vaporized and carried away by the air, but some of it runs down on the lower part of the coil, which may still be below 32°, so the water refreezes into ice, and thus further slows up the defrosting of the lower portion of the coil.

Inside the coil, the gas in the top coils is warmed, but it cannot rise to a pressure above the saturation pressure corresponding to the temperature of the warmest liquid in the coil. The pressure in the coil—and consequently the suction pressure when the compressor is not running — depends upon the temperature of the warmest *liquid* refrigerant.

COIL NOT ALL AT SAME TEMPERATURE

The liquid in the coil is not all at the same temperature. That in the upper part may be several degrees warmer than that in the bottom coils. If the pressure control were to be set to cut in at 31 p.s.i.g. corresponding to 33°, this would mean that the machine would start when the liquid in upper passes had warmed up to 33°. Consequently, the frost would be melted off these upper passes.

The liquid in the lowest part of the coil might still be no warmer than 28°, so the frost would still not be melted off the bottom passes. Nevertheless, the suction pressure depends on the *warmest* liquid, so the pressure control must be set at, say, 37 p.s.i.g. corresponding to a saturation temperature of 40°.

Thus, the warmest liquid in the coil has warmed up to 40° before the coldest liquid at the bottom has warmed up to 33°, which it must if the frost and ice are to melt off the bottom part of the coil as well as the upper passes before the machine starts.

WARMEST LIQUID DETERMINES CUT-IN SETTING

This is essential on the "self-defrosting" cycle. Otherwise during each run, the frost and ice would build up on the lowest, coldest coils. So we must set the pressure control to cut in at a high enough pressure to allow *all* of the coil, the coldest passes at the bottom, as well as the warmer passes at the top, to warm up above 32° before the machine is allowed to start its next running cycle.

The above normal temperatures and pressures during the off cycle assume that the other parts of the low pressure portion of the system —the suction line and the compressor—are at a temperature of 40° or more.

CUT-IN SETTINGS FOR 35° AND 30° BASEMENTS

If the suction line and compressor are at 35°, then the pressure control could not be set to cut out at a pressure higher than about 32½ p.s.i.g. corresponding to 35°. As soon as the pressure in the blower coil started to rise about 32½ p.s.i.g., this vapor at 35° would pass down through the suction line and condense in the 35° suction line and compressor.

The pressure in the blower coil just could not rise above 32½ p.s.i.g., so the warmest liquid in the coil could not rise above 35°. But the coldest part of the liquid might still be down to 27° or 28°, and the frost on the lower coils containing the 27° or 28° liquid would not have melted off yet.

In a 35° basement, it would be very difficult if not impossible to operate on a self-defrosting cycle using a low pressure control. To get the machine to run, the low pressure control would have to be set to cut in at 32½ p.s.i.g., corresponding to 35°, and the colder part of the coil would not have defrosted yet.

If the low pressure control were set to cut in at 37 p.s.i.g. corresponding to 40°, with the machine in a 35° basement, the suction pressure just would never get up to 37 p.s.i.g. and the machine would never start, regardless of how warm the blower coil became. The refrigerant, as it warmed above 35°, would simply vaporize and condense into the compressor and cold suction line in the basement.

With a 30° basement, the situation would be even worse, for the pressure corresponding to 30° saturation is 28½ p.s.i.g., so the suction pressure would never get above 28½ p.s.i.g. It is quite obvious that a cut-in setting of the low pressure control of 28½ p.s.i.g. would not permit a self-defrosting cycle.

SELF-DEFROSTING IF BASEMENT IS BELOW 40°

We see, therefore, that it is difficult to operate commercial fixtures on a defrosting cycle, if the machine is located in a place where the temperature is less than 40°, and we may run into operating troubles if the machine location is 40° to 50°.

We have mentioned that if the suction line and compressor are colder than the evaporator, refrigerant vaporized in the evaporator passes through the suction line and condenses into the compressor and the portion of the suction line that is in the cold machine room. We have referred to this only in respect to its effect on the setting of the low pressure control, on the defrosting of the evaporator and on the temperature and humidity in the cooler.

In addition, this condensed refrigerant in the compressor has a very damaging effect on the compressor. This will be discussed in next week's issue. Also, methods will be outlined by which some of the difficulties previously discussed can be partially overcome.

(To Be Continued)

Current Literature

To obtain further information on the literature listed below, please refer to key number preceding listing. Please use the "Information Center" form on "What's New" page.

Royal Jet Literature Displays New 1954 Line

——KEY NO. P-410——

ALHAMBRA, Calif.—An all new 1954 line of Royal Jet's "Forced-Flow" and "Jet-Flow" heating units is presented in a striking red and black folder which pictures the new units, explains the mechanical and heating advantages, and includes complete framing instructions.

Henry Condensed Bulletins Cover All Products

——KEY NO. P-411——

MELROSE PARK, Ill. — Two new condensed bulletins covering all the company's products have been published by the Henry Valve Co. here.

Bulletin No. 1010 covers "Freon" valves and accessories and Bulletin 2010 covers ammonia valves and accessories.

The condensed bulletins, the company said, are printed on glossy enamel paper to permit satisfactory reproduction if a wholesaler desires to print his own catalog by offset or planograph method.

Neoprene Notebook No. 58 Offered by Du Pont

——KEY NO. P-412——

WILMINGTON, Del.—Neoprene Notebook No. 58, published by the Rubber Chemicals Div. of E. I. du Pont de Nemours & Co., describes a flexible coolant tube that stays on target. It also contains an article on how the rubber industry runs its tests and what the test results mean to engineers and designers of rubber parts.

Protective Plastic Closures Described In New Bulletin

——KEY NO. P-413——

NEW YORK CITY—A new two-page Bulletin P-5312 has been issued by the S. S. White Plastics Div. describing a line of protective plastic plugs and caps for sealing openings and tube ends during shipping, maintenance, and storage.

The plugs and caps are made of a rubber-like elastoplastic vinyl to allow easy insertion and removal and to permit the closures to hold by friction fit.

The material is not normally affected by oils, grease, or gasoline, according to the company. The plugs fit a range of hole diameters from ¼ in. to 1 in. The caps fit a range of tube diameters from 3/32 in. to 1 in.

Also described are a line of tapered pipe plugs especially designed to be used in pipe with internal N.P.T. pipe threads from ⅛ in. to ¾ in.

Booklet Outlines Cutting, Grinding Procedures

——KEY NO. P-414——

TOLEDO — A new four-page brochure containing a pocket size 44-page booklet on cutting and grinding procedures has been issued recently by the Master Chemical Corp. here, manufacturer of trim cutting and grinding fluid.

Both the brochure and the booklet contain charts and graphs showing recommended concentrations for machining different metals in all metal-working operations, as well as comprehensive technical data pertaining to proper methods to increase production and prolong tool life.

Nor-Lake Catalog Contains All 'Specs' on All Models

——KEY NO. P-415——

HUDSON, Wis.—Publication of a new catalog containing the complete Nor-Lake line of refrigeration equipment has been announced by Nor-Lake, Inc., manufacturer of freezers, coolers, and liquid refrigeration units for home and commercial use.

Each Nor-Lake product is pictured, and complete specifications on every model are listed, along with certain operating diagrams and cross-sectional views. The two-color catalog is expandable for additional new products and has a heavy cardboard folder to keep the contents intact.

Included in the catalog are: Dry bottle coolers, ice cube makers, bottle dispensers, basement tap boxes, walk-in coolers, walk-in freezers, plug-in refrigeration panels, upright freezers, and direct-draw taps.

Worthington Bulletin on Package Air Conditioner

——KEY NO. P-416——

HARRISON, N. J.—A new bulletin which introduces its new package air conditioner is now being offered by Worthington Corp.

The bulletin, C-1100-B49, illustrates parts and operation factors of the unit and gives dimensions and capacities available, according to the firm.

Tenney Issues Folder On 'TWC' Comfort Coolers

——KEY NO. P-417——

UNION, N. J. — A four-page folder on Tenney's "TWC" comfort coolers with filter sections for air conditioning applications has been published recently by Tenney Engineering, Inc. here.

The folder gives complete construction details, specifications, illustrations, dimensions, application data, as well as prices, and warranty.

Bulletin Describes G-E Heating Controls

——KEY NO. P-418——

SCHENECTADY, N. Y.—A new 12-page bulletin on simplified heating controls for all oil burners has been announced by the General Electric Co. here.

Especially written for oil burner dealers and servicemen, the two-color publication includes step by step installation photographs on the complete line of G-E oil burner controls.

It also provides information on the company's heating control exchange plan, an introductory offer by which dealers can turn in inoperative controls of any make and get factory rebuilt G-E controls in return.

Designated GEA-6118, the bulletin describes free promotional aids available to all G-E oil burner control dealers.

Remington Explains Its Third Way of Residential Cooling

——KEY NO. P-419——

AUBURN, N. Y.—An eight-page bulletin announcing Remington's new "third way" system of residential air conditioning was released recently by Remington Corp. here.

This system, according to the bulletin is designed to "give both the builder and the homeowner the desired result at the least cost."

The bulletin gives examples of how this can be done with Remington units and then provides detailed specifications of the company's residential air conditioning line.

Chart Helps Select Right Activated Carbon for Job

——KEY NO. P-4110——

COLUMBUS, Ohio—A new chart to help select the right type of activated carbon for particular jobs has been developed by the Barnebey-Cheney Co. here.

The Adsorbite type selection chart lists a number of contrasting applications and suggests specific grades of activated carbon most likely to be found suitable for specific adsorption problems.

Among the applications listed are air purification, odor removal, and water treatment.

Free copies of the chart are available.

New Westinghouse Regional Managers

FIRST MEETING of the new regional managers for Westinghouse major appliances is shown above as the session opened at the company's Electric Appliance Div. headquarters plant, Mansfield, Ohio. Seated around the conference table, reading clockwise, are: W. T. Baker, Pacific Coast region; M. E. Lanning, southeastern region; R. J. McDonald, eastern region; G. H. Meilinger, major appliance sales manager; R. J. Sargent, manager of major appliances for the division; R. C. Dunson, southwestern region; W. A. Douglass, central region; and R. C. Walker, northwestern region.

New Westinghouse Appliance Plant Has Capacity of 4,000 Units Per Day

Lifts and Conveyors Play Part In Keeping Refrigerators Flowing

COLUMBUS, Ohio — Westinghouse refrigerators are coming off the assembly line in the Columbus plant of the Appliance Div. at the rate of two-every-minute. When production lines now planned are in operation, this figure will be increased considerably.

The starting point for all refrigerators at Columbus is the steel storage and shear and press shop area. At this point sheet steel for the outer shell, the inner liner, the door, the many small parts, and electrical sheet steel for the compressor motor are received, inspected, and released to the manufacturing operations.

Machines Take Over

From here on machines do everything: Stamp out 500 compressor motor laminations a minute; coat structural sheet with a drawing compound; shear sheets to size; draw, form, trim, and notch structural sheet into hundreds of small, intricate parts; blank sides, top, and bottom of the door frame which are then joined together by welding; form the refrigerator door, then trim and pierce.

From the press shop, all fabricated small parts are moved by pallet to the production line. To do this "grunt and groan" job of material handling the easy way, there are available throughout the plant 65 electric lift trucks and 18 electric walking trucks.

Subassemblies, such as the welded refrigerator door and door frame, are moved to the shell and door fabrication and metal finish section by overhead conveyor—there being some 27 miles of overhead and floor conveyors in the plant split into 51 separate systems.

Tops, Bottoms, Skirts Formed

In a separate press and fabrication area, large presses blank and form the tops, bottoms, and skirts for the inner liner or food compartment. These are later welded together in a six-wheel seam welder. The welded liners move through a metal finish line and are then taken by an overhead conveyor system to the degreasing and pickling machine, and then to the porcelain enamel department.

Food compartments are then conveyed to a subassembly area where all shelf supports are inserted and speed nuts and tap bars are put in place for attaching the evaporator. The inner liners then move by overhead conveyor to the refrigerator assembly line.

Refrigerating Unit Has 4 Components

The Westinghouse refrigerating unit is made up of four basic components: The evaporator, the condenser, the compressor, and the temperature control. In the "Frost Free" models there is a fifth component: The automatic defrost control. All these basic components are assembled from many separate parts.

The evaporator is made of two separate sheets of aluminum, each of which has furnace brazed to one side a zig-zag shaped piece of aluminum tubing. The larger sheet of the two is bent into a rectangular shape that forms the sides and bottom of the finished evaporator.

The smaller sheet is riveted to the larger sheet so as to form the back of the evaporator. The assembly is then charged with processed dry air at 200 p.s.i. and dipped in a water tank to test for

(Concluded on next page)

CLEANLINESS and ease of maintenance have been stressed in the design of the interior, such as seen along the refrigerator assembly line. The long, sleek exterior walls are windowed continuously at two levels from end to end of the plant, requiring a total of 93,000 sq. ft. of glass.

Facts about New Westinghouse Appliance Plant In Columbus, Ohio

Construction—begun in September, 1952; completed in March, 1954.

Total size—over 2,000,000 sq. ft. of working area, or 45 acres.

Size of site—plant covers 37 acres of a 315-acre site.

Plant cost—total, $45,000,000 ($20 million for construction; $25 million for equipment).

Present employment—1,500.

Eventual employment—6,000 to 7,000.

Production started—November, 1953.

Production at present—800 refrigerators a day (representing only a portion of the division's total production of refrigerators—as the Columbus plant is currently producing only small models; other refrigeration production is currently located in Mansfield—eventually will be moved to Columbus and Westinghouse refrigeration capacity will double).

Production capacity of plant—4,000 major appliances per day.

Warehouse capacity—approximately 100,000 major appliances.

Railroad facilities—indoor tracks will accommodate 49 freight cars; six miles of railroad siding enter plant at eight points; plant will receive approximately 60 carloads of raw materials and ship approximately 90 carloads of finished products every day when the plant is in full operation.

Truck facilities—41 indoor truck docks, each equipped with an automatic leveler that quickly drops into place for loading regardless of truck size.

Conveyors—plant is equipped with 51 different conveyor systems stretching a total of 27 miles. Sixty-five electric trucks also serve the plant, chiefly in warehousing.

Stage—160 ft. long; front opening, 48 ft. long, 22 ft. high; facilities for 32 backdrops, with 11 currently in use. Stage also equipped with freight elevator backstage.

Assembly hall and adjoining display room—wall of tiered, corrugated aluminum separates assembly hall from display room and can be lifted by pressing a button. Seating capacity of assembly hall, 800; with wall raised and additional seats in display room, 1,000.

Cafeteria—cost $250,000 for equipment and construction; seating capacity, 732; four food lines can serve 32 people a minute.

HOUSEHOLD REFRIGERATION

MECHANIZED to provide the maximum in automatic materials handling, the new Westinghouse plant uses 51 separate conveyor systems stretching a total of 27 miles to get appliance parts at the proper location when needed.

27 Miles of Conveyor Systems Speed Materials Handling In New Factory

(Concluded from preceding page)

leaks. The entire evaporator is then anodized, dipped in molten wax, and baked dry. It is then ready for the refrigeration unit assembly line.

Condenser Made Up of 3 Major Parts

The condenser is made up of three major parts: The back plate and two side rails. The back plate has two rows of crimp slots 2¼ in. apart down its entire length. Copper-coated steel tubing is laid in the slots to form a zig-zag pattern and the slots are crimped closed over it.

The side rails are formed and cut off in an automatic rolling machine using coil steel stock, and then welded to the back plate in a special multi-tip welder. The condenser is degreased; side brackets and yoke are welded in place for mounting the compressor; and rubber caps are placed over ends of tubing to mask them from paint and to keep out the dirt. The completed assembly is then sprayed with black enamel, dried in an oven, and conveyed to a storage area.

Compressor as used here means motor and compressor as both are hermetically sealed in the same housing.

Stators Go Through Pusher-Type Furnace

Stator and rotor laminations for the motor are automatically stamped from special electrical steel and properly annealed to produce the highest efficiency. All stators are passed through a pusher-type furnace to further improve the electrical qualities of the steel.

Rotor punchings are annealed in separate ovens, then stacked, skewed, and pressed onto rotor hubs for alignment of slots. Next, molten aluminum is forced through the rotor slots in a die casting machine. The die-cast rotor is machined to dimensions and then annealed to improve the characteristics of the aluminum. After annealing, the rotor is bored, faced, and then checked on air limit gauges for tolerances. The rotor is then checked on a reverse rotation test machine for inadequate or missing conductor bars in the aluminum casting; also for wattage and ampere ratings for efficient operation. Thus, a greater rotor life is assured.

Automatic Winding Machine Assures Uniformity

The four main pole coils of the stator are wound on an automatic winding machine. This assures greater uniformity of tension during coil formation as well as uniformity in the number of turns per coil. Any deviation in the number of coil turns would have a marked effect on the efficiency of the motor.

Starting windings are wound over the main windings on automatic winding machines. Insulated sleeves are slipped over the coil ends, connections brazed, and the coils are wedged, shaped, and sewed in place. Then electrical tests are made on special surge test boards. Here checks are made for grounds, open circuits, and wattage variances.

Varsol Washer

Compressor parts pass through an automatic Varsol washer which is conveyorized and sends cleaned parts to an air conditioned room for gauging and assembly. This Varsol wash removes dirt and grime and leaves in its place a light protective coating of oil. The cleaning solution is checked daily and filtered continuously.

Special machines are used to size and sort all pistons, cylinders, and wrist pins. These assure a match of parts within 0.0001 in. After parts are sized and matched, they are sent to the compressor assembly line.

As the motor housing moves along the assembly line, the rotor, thrust washer, and shaft are pressed into it; then in step-by-step operations the stator, matched cylinder and piston assemblies, muffler and strap assembly, washers, screws, and bolts are assembled to make the compressor or pump assembly.

Pump Assembly Tested

The completed pump assembly is then tested on special dynamometer test boards which check the main and starting windings for grounds and open circuits on an actual run, pump time required to reach pressure of 200 p.s.i., leaks at 200 p.s.i., and amperage and wattage under running conditions.

The inspected pump assembly is then pressed into a compressor shell to which terminals have been attached, and leads from the stator are soldered to them.

The compressor is then baked in an oven at 280-300° F. for five hours to remove any residual moisture. Upon emergence from the oven, the end head is welded on and the compressor tubes temporarily sealed. The unit is then ready for an immersion test.

Before immersing in water, the compressor is charged with processed dry air at 200 p.s.i. pressure. After the immersion test, the compressor is ready for painting and use on the refrigerating unit assembly line.

Build-Up Is Rapid

The initial step in the assembly of the refrigerating unit is to hook a condenser to the overhead conveyor. From that instant the build-up is rapid: Clips are assembled to the condenser to hold the drier, heat exchanger, and cable in position; the discharge tube and heat exchanger are attached to the condenser; the evaporator mounting brackets are assembled and the evaporator attached; then the discharge tube is brazed to condenser and suction tube to evaporator. The assembly is then dehydrated in an overhead oven at 275° F.

Assembly Purged with Dry Air

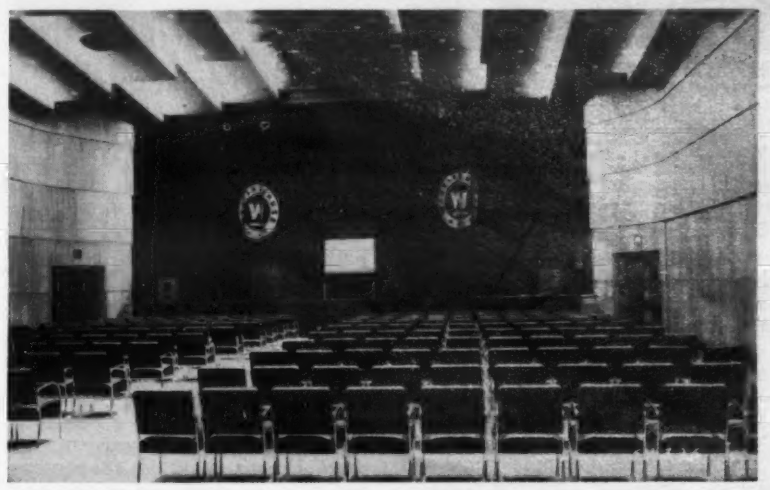
When the assembly returns from the oven, it is purged with dry air, the capillary tube is welded to the evaporator, and a drier that has been dehydrated in a vacuum oven at 410° F. for 3 hours is welded to the capillary tube and the evaporator. The compressor is mounted on springs, the compressor mounting bolts secured, and the discharge tube welded to compressor. The assembly is given an air flow test to assure there is no clogging.

The compressor charging tube is cut off, an extension brazed on it, the suction tube welded to compressor, and the unit charged with dry air at 200 p.s.i. and sealed. The unit is immersed in water tank to check for leaks, the air removed, oven dried to remove moisture, and a "handsome valve" attached.

It is then evacuated for 31 minutes on a vacuum pump that pulls a vacuum of no more than 1,500 microns and it is charged with "Freon" refrigerant and oil by automatic equipment which rejects any unit not holding proper vacuum. The unit is sealed, passed through water tank to check for leaks, oven dried, and given an electronic leak detector test. Then the controls and thermostat are attached and the unit is balanced by adjusting compressor mounting springs and shaping all tubes. A test cord is attached, the unit inspected, and it is ready for a performance test.

The first step of the performance test is to start and run the unit on 140 volts for 4 seconds to lubricate the compressor. Second, the unit is checked for starting on 95 volts, run for one minute to see that it refrigerates, checked for grounds, run 45 minutes and checked for wattage, and then given complete check to insure proper over-all operation.

The unit then passes through a quiet room for the noise test; then another electronic leak test; and finally it receives a serial number plate and is ready for use on the refrigerator assembly line.



CONSIDERED to be one of the largest industrial stages in the country, the stage located on the second floor of the office building is 160 ft. long, has a front opening 48 by 22 ft., and has facilities for 32 backdrops. The assembly hall can seat 800 persons with 200 additional seats available by use of the adjoining display room. It will be used for training schools for appliance salesmen, introduction of new product lines, and presentations of interest to the general public.

Marlow Pumps Opens New Plant In Longview, Texas

LONGVIEW, Texas — Marlow Pumps, Div. of Bell & Gossett Co., with headquarters at Ridgewood, N. J., has announced the establishment of a new branch manufacturing plant at Longview, 125 miles east of Dallas.

The new plant's location in the rapidly-developing industrial center of east Texas "offers vastly improved shipping facilities and will offer even faster service to Marlow's customers," the company said. Marlow executives estimate that the average shipping time will be cut some 30% by the move.

The company's plant in De Queen, Ark., as a result of the improved service afforded by the Longview plant, will be shut down and all operations formerly conducted in De Queen will be transferred to Longview.

The complete Marlow line of engine-driven, self-priming, and end-suction centrifugal pumps will be manufactured at the Longview plant. A stock of all pumps and parts will be maintained and service facilities will be available.

Fire Destroys Store

MAYVILLE, N. Y.—Fire of undetermined origin caused damage of about $25,000 when it virtually destroyed Durk's Electric Appliance Store at 21 South Erie St.

Thermal Co. Opens Sixth Store In Minneapolis

MINNEAPOLIS—With the opening, on March 15, of a major store and warehouse at 1401 Hennepin Ave. in Minneapolis, Thermal Co., Inc. now has locations in six of the principal cities of the Upper Midwest in addition to the executive offices and warehouses in St. Paul.

The new location provides approximately 9,000 ft. of space. All major equipment and supply lines will be made available at the new location. E. F. King, president, expects that a staff of 15 persons will soon be employed at the new location.

The executive management will be conducted from the St. Paul location.

The Minneapolis office will be manned by Bob Iten and Stan Gossard, who are well known to the local trade.

Thermal Supply Celebrates Its Fourth Anniversary

HOUSTON, Texas — Thermal Supply, refrigeration parts wholesaler here, held its fourth anniversary open house from 4 to 9 p.m. on April 1.

The event took place in the firm's new quarters at 1515 Dallas St., a company announcement said.

Electric Auto-Lite To Make Liquid Receiver Tanks In Lockland Plant

TOLEDO—Expansion of facilities in its Lockland (Ohio) plant for the manufacture of liquid receiver tanks for the refrigeration industry has been announced by Royce G. Martin, president and chairman of the board of The Electric Auto-Lite Co.

"Principal feature of the Auto-Lite liquid receiver tank is that it is made from deep-drawn shells rather than tubing with welded head and base plates," the company stated.

"Auto-Lite is capable of producing shells up to 9½ in. in diameter and 36 in. in length. All receivers meet either Underwriters Laboratories or A.S.M.E. specifications, and shells can be manufactured to meet test pressures up to 3,000 p.s.i."

Although the firm is commonly known as a leading independent manufacturer of automotive electrical parts, many products for the refrigeration industry are turned out in the 29 Auto-Lite plants from coast to coast, including instruments and gauges, zinc and aluminum die casting, box lights, and wire and cable, Martin pointed out.

Montreal Firm Named Jobber for Copeland

SIDNEY, Ohio — Copeland Refrigeration Corp. here recently announced the appointment of Railway & Engineering Specialties, Ltd. of Montreal as exclusive, authorized Copeland jobber for Canada, with the exception of British Columbia which is served by Refrigerative Supply, Ltd., Vancouver.

Railway & Engineering Specialties will carry a complete stock of Copeland belt-driven and "Copelametic" units and a full line of Copeland replacement parts for all units.

Railway branches in Toronto and Winnipeg will also carry complete stocks. The Toronto branch will be able to provide repair facilities to all of Canada.

Jan. Wholesaler Sales of Commercial Equipment and Parts 9% Above 1953

WASHINGTON, D. C. — Wholesale sales of commercial refrigeration equipment and parts during January were 9% above January, 1953 but 4% under December, according to the Census Bureau.

The Bureau also reported that sales by appliances and specialties wholesalers were down 4% from a year ago and down 24% from December.

Inventories among the commercial group were up 3% over January, 1953 and down 1% below December. Appliances and specialties inventories were up 1% over January, 1953 and up 3% over December, according to the Bureau.

While appliances and specialties sales were down generally throughout the country as compared with December, the comparison with a year ago showed wide variations. Sales were above last year in the middle Atlantic and north central states, and varied from a decline of 3% in New England to a drop of 25% in the Pacific states.

While a complete breakdown was not given for commercial refrigeration wholesalers, sales were reported up 23% in the middle Atlantic states and down 12% in Pacific states compared with 1953.

Sales

Kind of Business and Geographic Division	Per Cent Change —Jan. 1954— from Jan. 1953	from Dec. 1953	January 1954 Panel No. of Firms Reporting	Reported Dollar Values (add 000)
Appliances and specialties wholesalers	— 4	—24	100	17,408
New England	— 3	—25	9	1,759
Middle Atlantic	+ 5	—25	20	5,936
East North Central	+ 1	—26	15	2,872
West North Central	+ 7	—30	13	1,455
South Atlantic	—19	—28	13	1,490
South Central	—10	— 4	11	1,304
Mountain	— 5	—11	7	985
Pacific	—25	—27	12	1,607
Refrigeration equipment parts, (com'l)	+ 9	— 4	76	1,665
Middle Atlantic	+23	0	14	566
East North Central	+ 1	+ 1	17	153
South Atlantic	+ 3	—10	25	476
Pacific	—12	—11	9	117

Inventory, End-of-Month (At Cost)

Kind of Business and Geographic Division	Per Cent Change —Jan. 1954— from Jan. 1953	from Dec. 1953	January 1954 Panel No. of Firms Reporting	Reported Dollar Values (add 000)
Appliances and specialties wholesalers	+ 1	0	81	20,834
New England	+ 1	+ 6	6	1,604
Middle Atlantic	0	— 8	15	4,833
East North Central	+ 5	+ 3	11	3,027
West North Central	+13	+10	12	2,680
South Atlantic	— 6	0	13	2,664
South Central	— 2	+10	9	2,579
Mountain	— 7	—10	7	1,698
Pacific	0	— 1	8	1,749
Refrigeration equipment, parts (com'l)	+ 3	— 1	65	4,113
Middle Atlantic	0	— 1	11	910
East North Central	+16	+ 1	12	590
South Atlantic	+ 4	— 2	25	1,519
Pacific	— 3	— 3	8	371

Sprague Electric Appoints Parrish To Head New Plant

NORTH ADAMS, Mass. — Appointment of Robert L. Parrish as manager of the new plant of the Sprague Electric Co., now under construction at West Jefferson, N. C., has been announced by Ernest L. Ward, executive vice president.

The new Sprague plant, which will manufacture capacitors (electrical condensers) for the electrical and electronics industries, will open late this spring. It is the sixth branch plant to be established by the North Adams concern.

Parrish, who has been associated with the main plants of the company at North Adams for some time, was formerly senior chemical engineer with Abbott Laboratories, North Chicago, Ill.

Dill Heads Honeywell's Sales Office In Seattle

MINNEAPOLIS—E. F. Dill has been promoted to manager of the Seattle sales office of Minneapolis-Honeywell Regulator Co. He formerly was branch commercial sales manager in the San Francisco office.

At Seattle, he succeeds W. G. Warrington who has resigned to become vice president and general manager of Rossoe Mfg. Co.

R. J. Conner has been named to succeed Dill as branch commercial sales manager at San Francisco.

18% Nickel Silver Made In Ultra Thin Gauges

NEW YORK CITY — With the lifting of restrictions on nickel, 18% nickel silver strip—precision rolled to very close tolerances and to thin gauges and foils—is now available for use in the manufacture of components for the refrigeration, air conditioning, plumbing, and heating industries, the Industrial Div. of American Silver Co., Inc. has announced.

Brilliant silvery white in color, 18% nickel silver is a highly malleable and ductile metal that is tough and highly resistant to corrosion, wear, and fatigue, the company said.

It is custom rolled by American Silver in strips up to 6 in. wide, and down to .0005 in., to tolerances as close as ±.0001 in.

Typical uses for 18% nickel silver strip in the refrigeration, air conditioning, plumbing and heating industries include: diaphragms; springs; stamped, drawn, or spun components; trim of all kinds; electrical and electronic components; instrumentation; and hardware.

Alaskan Room Coolers--

(Concluded from Page 1, Col. 2)

were shipped air freight collect at the customers' request," Tay said. "This added about $70 to the cost of each unit.

"Our experience in Alaska this winter should prove that air conditioners are sold not only in localities that experience high temperatures and humidity. The Alaska Div., with headquarters in Anchorage, delivered many cooling units to taverns and bars in that booming city to remove smoky, stagnant air, to ventilate the premises, and to circulate fresh, filtered air for occupants."

Ben-Hur Appoints Four New District Managers

MILWAUKEE—Appointment of four new Ben-Hur district managers was announced recently by R. C. Graves, general sales manager of the Ben-Hur Mfg. Co. located here.

William S. Hall, formerly director of sales for the HarderFreez Div., Tyler Refrigeration Corp., has joined Ben-Hur as district manager for the Raleigh, N. C. territory. He will supervise distributors and dealers in Virginia, North and South Carolina.

Marvin Dahl has been appointed west coast district manager to succeed E. F. Jackson who becomes western regional sales manager. Dahl was formerly with Tractor Sales Corp. of Los Angeles.

Bert K. Hinrichs, formerly general manager of Love Electric Co., Seattle, has been named upper New York district manager operating in the Rochester, Buffalo, Syracuse, Albany, and Poughkeepsie trading areas.

Vern L. Kilby, formerly with Philco Appliance Div. at Dallas, has joined Ben-Hur as Detroit district manager. His territory will also include the Saginaw, Grand Rapids, Fort Wayne, Toledo, and Cleveland trading areas.

Corbin Represents Koch In Four-State Territory

NORTH KANSAS CITY, Mo.—Appointment of Carl E. Corbin as district sales representative for Koch Refrigerators, Inc. here has been announced by C. K. Litman, president of the commercial refrigerator and unitized air conditioning firm.

Carl E. Corbin

Corbin will represent Koch in Minnesota, Iowa, Nebraska, and Colorado.

Corbin's background includes 32 years in the commercial refrigerator business. Before selling his interest in Viking Refrigerators in 1952, he was vice president and sales manager of Viking, president of Viking Sales Corp., and president of the Equipment Finance Co.

He also operates the Corbin Sales Agency in Kansas City, Mo., representing manufacturers of related refrigeration products in that area.

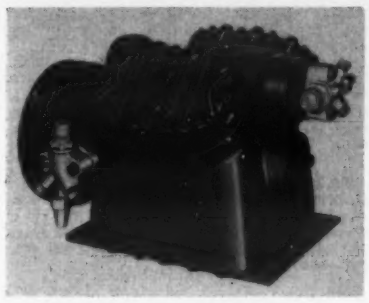
G. C. Hocker of Tulsa Firm Dies at 61 of Heart Ailment

TULSA, Okla.—Funeral services were held here recently for George G. Hocker of Hocker Refrigeration Co., who died of a heart ailment. He was 61.

Since moving to Tulsa from Florence, Oregon, in 1949, Hocker had been associated with his brother, V. W. Hocker, who owned Hocker Refrigeration. He had operated a locker plant and retail meat business in Florence.

Hocker was a member of the Oil Capital Chapter of the Refrigeration Service Engineers Society in Tulsa.

Surviving Hocker are his wife, Mabel, two sisters, and the brother.



Copeland Auto A. C.--

(Concluded from Page 1, Col. 4)

Suction and discharge reeds are of fine Swedish steel.

"The field-proven valve plate is Copeland designed and has been used successfully for years. Crankshaft is counterbalanced for smoother operation. The seal is one of the coolest parts of the compressor due to an exclusive cooling system."

The compressor is a "V" type with four cylinders and is designated as model 84.

Frigidaire Prices--

(Concluded from Page 1, Col. 5)

The dealers' sales efforts will be backed up by factory promotional campaigns in all media, highlighted by the 25th anniversary room air conditioner celebration. Extensive magazine advertising is scheduled, radio and television spots have been planned, hundreds of dealer ads and helps have been developed and produced by the factory, a great number of display materials to catch the customer's eye will be available, and sales and service schools are being set up for all Frigidaire dealers and key salesmen to attend.

N. Y. Assembly Passes Death Trap Bill

ALBANY, N. Y.—The New York State assembly has approved and passed on to the senate a bill that would make it a misdemeanor to discard a refrigerator or other container with automatic locks in a place accessible to children without first removing the fasteners, catches, or doors.

The assembly passed the bill unanimously.

Pheonix Parts Wholesaler Moves to New Building

PHOENIX, Ariz.—State Equipment & Supply Co., refrigeration parts wholesaler, is now doing business in its new home at 416 S. 7th Ave. here.

The new building has more than 3,600 sq. ft. of display space and a special loading and unloading platform in the rear, with ample storage space for large items. There is space for both inside and outside storage, the latter being an innovation made possible mainly by the favorable weather in this area, it was reported.

Plenty of free parking space around the building is another feature.

The company was founded in 1939 by R. O. McCormack, who has had more than 30 years of experience in the refrigeration business. It was formerly located at 31 S. 3rd Ave. in a building with limited facilities.

The firm held an open house recently to celebrate the official opening of the new quarters.

Air Conditioned Dairy Opened

CHARLOTTE, N. C.—The spacious new air conditioned plant of Southern Dairies, Inc., built at a cost of more than $1,000,000, was formally opened recently. Air conditioning, ventilating, and heating equipment was installed by Reliance Engineering Co., Inc. here.

L. A. Firm to Distribute York Line In So. Calif.

LOS ANGELES — W. R. Eby, district manager of York Corp., has anounced the appointment of Reliable Steel & Builders Supply Co., Los Angeles, as wholesale distributor for York air conditioning equipment in southern California.

The new distributor's area includes Orange, Ventura, Riverside, Inyo, San Bernardino, and Los Angeles counties.

According to Eby, Reliable Steel & Builders Supply has over 2,000 dealer accounts. The firm's warehouse contains over 50,000 sq. ft. and the company has its own fleet of trucks for delivery.

With the addition of the York line, the concern becomes a "one stop" organization for air handling equipment and assicated materials, it was reported.

Dravo Opens Frisco Office; Walton Appointed Manager

PITTSBURGH — Dravo Corp. here has announced the opening of a West Coast office in the Monadnock building, 681 Market St., San Francisco.

In addition to Dravo's line of oil and gas-fired industrial space heaters and process drying equipment, the San Francisco office will handle the sale of crane cab and steel mill pulpit air conditioning equipment, prefabricated power and process piping, open steel flooring, and Dravo construction services.

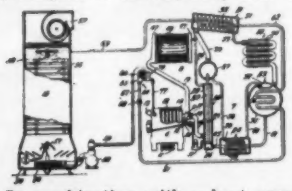
This office will be under the management of William A. Walton who has been with Dravo since 1940.

Frank S. Trumbower, who will join Walton as territorial sales and service manager, has been associated with Dravo since 1942.

PATENTS

Week of December 22 (Concluded)

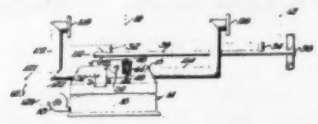
2,663,165. ABSORPTION REFRIGERATION. Walter M. Simpson, Evansville, Ind., assignor to Servel, Inc., New York.



1. In combination with a heat operated refrigeration system having a heat receiving element and a heat rejecting element, means for heating the heat receiving element comprising a fuel burner and a flue for the products of combustion, a conduit for flowing cooling water in heat exchange relation with the heat rejecting element, a Venturi tube in said conduit adjacent the flue and heat rejecting element, and a conduit connecting the flue and Venturi tube to cause flue gases to be drawn into the cooling water.

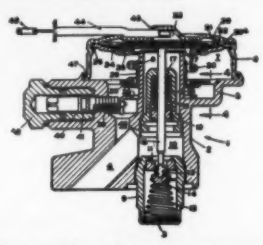
2,663,498. TEMPERATURE REGULATING SYSTEM. Bruce G. Copping, Cuyahoga Falls, Ohio, assignor to Don Mfg. Co., Chicago, Ill., a corporation of Illinois. Continuation of application Serial No. 747,470, May 12, 1947. This application Aug. 17, 1951, Serial No. 242,245. 2 Claims. (Cl. 236—1.)

1. A regulator for use in an air temperature conditioning system of the type wherein a plurality of shutters control air flow from a source of temperature conditioned air to spaces to be tempera-



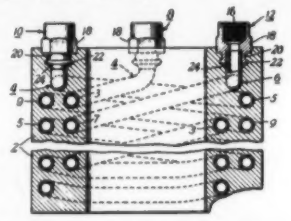
ture conditioned, said regulator including a switch in control of said source shiftable to a first position whereby said source is operative and a second position whereby said source is inactivated, a lever air pivotally supported at a fulcrum and operatively connected to said switch to shift said switch between said first position and said second position, a temperature sensitive element disposed partially within said source and pivotally connected to said arm to control the position thereof in direction to maintain the temperature of said conditioned air within predetermined limits, and bellows in communication with said source to control the position of said fulcrum to shift said arm to alter the temperature of said source in direction to increase the temperature differential between said source and said spaces as said bellows collapse.

2,663,502. REFRIGERATION EXPANSION VALVE AND ADJUSTMENT MECHANISM THEREFOR. Earnest J. Dillman and Thomas E. Noakes, Detroit, Mich., assignors to Detroit Controls Corp., Detroit, Mich., a corporation of Michigan. Application Jan. 24, 1950, Serial No. 140,194. 7 Claims. (Cl. 236—92.)



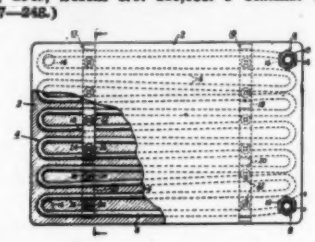
1. In a refrigeration expansion valve, a valve casing having inlet and outlet passageways, a valve member controlling flow of refrigerant through said passageways, an operating diaphragm in said casing arranged for actuation of said valve member, a spring opposing movement of said diaphragm in a valve opening direction, said casing having a guide projection extending toward said diaphragm, a supporting member for said spring slidably guided on and operable to have sliding movement longitudinally of said guide projection, a wedge member arranged to have movement transversely to said guide projection and cooperable with said supporting member upon movement to vary the position thereof on said guide projection thereby to vary the compression of said spring, and means to adjust the position of said wedge member.

2,663,548. BEVERAGE COOLER. Cecil Boling, Brewster, N. Y., assignor to The Heat-X-Changer Co., Inc., Brewster, N. Y., a corporation of New York. Application March 20, 1948, Serial No. 16,050. 5 Claims. (Cl. 257—241.)



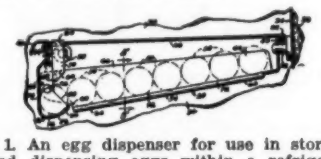
1. In a heat exchange unit for cooling a liquid, a liquid tube adapted to have a liquid to be cooled flow therethrough, a metal block surrounding said tube with each of the ends of the tube being substantially at one flat surface of the block and with the block forming a wall of substantial thickness around the entire tube between said ends, and a pair of pipe fittings positioned respectively at said ends of said tube and each rigidly fixed to its tube end whereby the two fittings provide for the flow of liquid through said tube, each of said fittings having an embedded portion which is noncircular in cross-section with flat side surfaces and which has an anchor portion which is remote from the external portion of the fitting and which projects radially outwardly with respect to the axis of the fitting with the block having a portion which mates with said anchor portion and counteracts any tendency for the fitting to move axially of the fitting away from its position with respect to said tube, each of said fittings also having an external portion which presents flat surfaces and is adapted to receive a tool and by which a liquid connection may be made through the fitting to the tube.

2,663,551. PLATE COOLER. Cecil Boling, Brewster, N. Y., assignor to The Heat-X-Changer Co., Inc., Brewster, N. Y., a corporation of New York. Application Aug. 16, 1949, Serial No. 110,588. 3 Claims. (Cl. 257—248.)



1. In a heat exchange unit of the character described, the combination of, a liquid tube adapted to have a liquid flow therethrough for the carrying on of a heat transfer operation, said tube being bent into the form of a flat tube configuration with the tube having its axis substantially in a single plane and with the tube being substantially confined between two parallel planes which are spaced apart a distance equal to the outside diameter of the tube, said tube having successive portions which extend in a predetermined spaced relationship with respect to each other, a pair of fittings attached respectively to the ends of said tube, one of said fittings comprises a metal block which has a radial opening into which the end of the tube extends and an axial passageway connected thereto to provide the fluid connection with said end of the tube, said last-mentioned fitting having a portion which is noncircular in cross-section and has flat side surfaces, said last-mentioned fitting having an anchor portion to which the tube end is attached and having a connecting portion remote therefrom and projecting from the axis of the tube end, a block of cast aluminum surrounding said tube with a wall thickness sufficient to withstand substantial forces within the tube and surrounding intimately the entire external surface of the tube between said fittings and enclosing said anchor portion of said last-mentioned fitting with the connecting portion thereof projecting from a surface of said block and providing a fluid connection through said fitting to the tube, said anchor portion of the fitting and the tube end providing a rigid anchor within the block and an interlocking relationship which prevents axial and turning movement of the fitting with respect to the block, and an embedded clamping structure for said tube comprising a plurality of strips and strip-holding means, said strips being in parallel mating sets with the strips of each set extending upon the two sides of the coil along said parallel planes with each strip extending across a plurality of said successive portions of the tube transversely thereto and along one of said parallel planes and each strip being substantially straight throughout the zones of contact with the tube, said strip-holding means interconnecting the mating strips and extending therebetween to hold the strips rigidly against the tube, said strip-holding means being out of contact with the tube and the strips and the holding means forming a structure which permits the entry of molten aluminum during the casting operation.

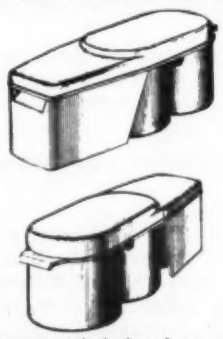
2,663,604. REFRIGERATING APPARATUS. Herbert L. Davies, Detroit, Mich., assignor to Nash-Kelvinator Corp., Detroit, Mich., a corporation of Maryland. Application June 1, 1950, Serial No. 165,538. 2 Claims. (Cl. 312—49.)



1. An egg dispenser for use in storing and dispensing eggs within a refrigerator comprising, an inclined runway receiving and feeding eggs downwardly by gravity, said runway having a discharge end, upstanding oppositely disposed sides extending along said runway and extending beyond the discharge end thereof to form a pair of ears, a cup member between and pivoted to said ears to swing about a horizontal axis, said cup member being arranged at said discharge end of said runway to receive the lowermost of the eggs, said cup member being moveable about its axis to face outwardly for access to the egg therein, and hangers on said ears for supporting said runway and also limiting swinging movement of said cup member in opposite directions.

DESIGNS

171,174. REFRIGERATOR-TYPE ICE CREAM FREEZER. James Teague, Chicago, Ill., assignor to White Magic Freezer Co., a corporation of Illinois. Application Feb. 16, 1953, Serial No. 23,622. Term of patent 14 years. (Cl. D67—2.)



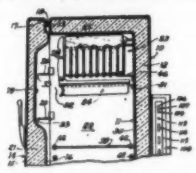
The ornamental design for a refrigerator-type ice cream freezer, substantially as shown.

Week of December 29

2,663,916. REFRIGERATOR CABINET. Clinton Millman, Greenville, Mich.

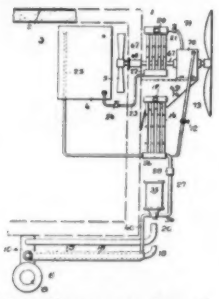
4. A door for a storage cabinet, comprising a generally dish-shaped outer door panel having a front wall and end walls and side walls, said end and side walls being provided withinturned flanges, an inner panel structure having an outer peripheral edge overlying said flange adjacent said side and end walls, said edge having an outwardly turned portion, a resilient gasket member having an outwardly projecting tang extending around said structure outer periphery and having an inwardly opening slot receiving said structure peripheral edge, securing means extending between said flange and said structure and clamping said structure to said flange for mutual support and for causing said outwardly turned portion of said peripheral edge to deform said gasket tang into tight engagement with the adjacent portions of said outer panel.

2,663,999. HOUSEHOLD REFRIGERATOR. Carl F. Alsing, Evansville, Ind., assignor to Seeger Refrigerator Co., St. Paul, Minn., a corporation of Minnesota.



2. A refrigerator cabinet comprising a sheet metal shell and a sheet metal liner carried thereby and spaced therefrom, and provided with insulation between the said shell and liner, the shell and liner extending substantially from the bottom of the cabinet to the top and being faced about a door opening by breaker strips, a substantially U-shaped evaporator located in the upper part of said cabinet and carried by the top of the liner and the rear wall of the liner, said evaporator having a transversely extending shelf spaced from its upper edges sufficiently to receive ice cube trays, molded plastic sliding guides carried by the side walls of said liner below said evaporator and a molded plastic insulating drawer slidably mounted in said guides below said evaporator but permitting air circulation past said drawer at the front and at the back of said drawer, a motor compressor carried by said cabinet and a condenser carried by the rear of said cabinet, said motor compressor including a mineral oil sump with a charge of mineral oil adapted to absorb refrigerant in varying amounts, depending upon the temperature of the oil, and a charge of refrigerant in the system which is sufficient to supply the shelf with refrigerant during every operation of the motor compressor, the refrigerant going first to the shelf coils and thereafter to the coils on the sides and bottom of said evaporator which cool the remainder of the cabinet and the absorption of refrigerant in the mineral oil increasing as the ambient temperature surrounding said cabinet drops so that as the ambient temperature decreases, the coils on the exterior of said evaporator receive a diminishing amount of refrigerant, and the food storage space exterior to said evaporator in said cabinet is maintained at a constantly suitable above-freezing temperature.

2,664,000. REFRIGERATING APPARATUS FOR TRANSPORTATION DEVICES. Frank W. Smith, Chicago, Ill. Application Jan. 18, 1951, Serial No. 206,625. 9 Claims. (Cl. 62—119.)

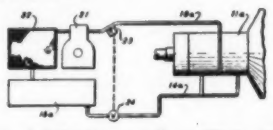


1. Refrigerating apparatus of the absorption type for cooling closed transportation devices both when in motion and when stationary, comprising, an evaporator within the device, a fan rotatably mounted in the device for blowing air over the evaporator, an air propeller rotatably mounted in the open air outside of the closed portion of the device in front thereof, means connecting the propeller with the fan for rotating the latter from the former by air currents created by movement of the transportation device, an absorber mounted on the outside of the device in the open air in front thereof and behind said propeller to receive cooling air therefrom, and means for rotating the propeller and fan when the device is stationary, said last mentioned means being inoperative to rotate the propeller when the device is in motion.

2,664,001. AIR CYCLE WATER COOLER. Walter R. Brisken, Dayton, Ohio, and Franz J. Neugebauer, Schenectady, N. Y.

1. An air cycle refrigerating system including a reservoir containing water, a turbine, a conduit extending from the turbine to a point near the bottom of the reservoir, a compressor used in removing the air from the reservoir above the water, a prime mover cooperating with the turbine in driving the compressor, means in the reservoir for breaking up the air bubbles bubbling up through the water from the conduit connecting the turbine to a point near the bottom of the reservoir, the turbine reducing the pressure of the air thereby cooling the air so that cooled and expanded air is delivered to the bottom of the reservoir, the air bubbling up through the water in the reservoir absorbing heat from the water in the reservoir, and means for utilizing the water in the reservoir.

2,664,173. METHOD OF AND APPARATUS FOR LUBRICATION AND COOLING OF SURFACES. Horace E. Karig, Pasadena, Calif.



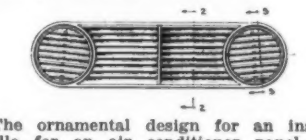
1. A lubrication and cooling system comprising a substantially closed casing, a bearing surface in said casing, a nozzle disposed to project a stream of liquid against said bearing surface, an inlet conduit connected to said nozzle feeding into said casing and containing a mixture of lubricant and vaporizable coolant, the pressure in said casing being less than that in said inlet conduit, an outlet conduit connected to said casing to remove lubricant and vaporized coolant therefrom, a compressor and cooler connected between said outlet conduit and said inlet conduit to compress the mixture and reliquefy said coolant, temperature responsive means located in said outlet conduit, and a valve in said inlet conduit connected to said temperature responsive means to be operated thereby so as to control the circulation rate of said mixture in accordance with the outlet temperature of said mixture.

2,664,244. AIR CONDITIONING CONTROL APPARATUS. Enoch Merle Miller, Bartlesville, Okla., assignor to Phillips Petroleum Co., a corporation of Delaware. Application May 16, 1950, Serial No. 162,308. 7 Claims. (Cl. 236—1.)

5. An air conditioning system for a building having a plurality of spaces, which comprises, in combination, an air conditioning unit adapted to deliver heated or cooled air to each of said spaces, a motor controlled damper for each of said spaces for regulating the volume of air delivered thereto in accordance with the temperature in said space; a plurality of motor control means each associated with one of said motors to thereby control the opening and closing of each said damper each of which comprises a normally balanced circuit having a control variable impedance means responsive to changes in temperature in said space, relay means for controlling the direction of rotation of said motor, balancing variable impedance means operated by said motor, connections between said relay means, said control variable impedance means and said balancing variable impedance means adapted to permit said relay to control the direction of rotation of said motor responsive to the variation in impedance of said control variable impedance means and being further adapted to cause said motor to vary the impedance of said balancing variable impedance means in such a manner that said circuit will become balanced thereby stopping the rotation of said motor, means for reversing the polarity of said balancing impedance means with respect to said relay means and said control impedance means; and a single means for reversing the polarity of said control variable impedance means, said relay means and said balancing variable impedance means in each of said plurality of motor means associated with each of said motors.

DESIGNS

171,238. INSERT GRILLE FOR AN AIR CONDITIONER PANEL. August G. Trometer, Sturgis, Mich., assignor to Gibson Refrigerator Co., Greenville, Mich., a corporation of Michigan. Application July 5, 1952, Serial No. 20,468. Term of patent 7 years. (Cl. D62—4.)



The ornamental design for an insert grille for an air conditioner panel, as shown.

Government Contracts

DEPARTMENT OF DEFENSE

Description	Quantity	Invitation No.	Opening Date
Bureau of Ships, Washington, D. C.			
Humidistats, human hair element type for operation on 110-volt, 60-cycle single phase IC current, minimum effective controlling range shall include twenty per cent to eighty per cent relative humidity and settings shall be so marked. Additional specifications as indicated in the invitation.	1368	549-836Q	16 Apr 54
Rome Air Development Center, Griffiss Air Force Base, Attn: RCMC, Rome, New York			
Air Conditioner-Mobile, 4(AAA-NSL 10200) Remington Model 36T Mobile Cooler or equal.	3 ea.	(30-602-54-94)	9 Apr 54
Purchasing and Contracting Office, Hunter Air Force Base, Savannah, Georgia			
Permanent Conversion of Hospital Quarters and Mess Building T-502 into an OB Ward. General Construction which includes the following: Air Conditioning System.	Job	(09-602-54-42B)	5 Apr 54
Yards & Docks Supply Officer, Port Hueneme, California Attn: Purchasing Division			
Refrigerator self-contained, electrically operated, 7-cu. ft. capacity.	85 ea.	20381/	12 Apr 54
Chicago Quartermaster Depot, Quartermaster Purchasing Division, Chicago, Illinois Bid forms now available do not request after opening date.			
Refrigerator mechanically cooled, Spec. AA-R-211C.	2054 ea.	54-182B	12 Apr 54
Refrigerator mechanically cooled 12-cu. ft. capacity. Spec. AA-R-211C.	294 ea.	54-198B	23 Apr 54
Supply Department, Puget Sound Naval Shipyard, Bremerton, Washington			
Air Conditioning Plants	4 ea.	529/54 Q	26 Apr 54
Base Procurement Division, EWMP, Building #120, Wright-Patterson Air Force Base, Ohio			
Furnishing and installing a Refrigeration System for the Propeller Hub Altitude Test Facility.	Job	(33-601-54-95-B)	22 Jun 54
Procurement Section, Camp Kilmer, New Brunswick, New Jersey			
Installation of air conditioning in two theaters at Camp Kilmer, Stelton, New Jersey.	Job	41B	22 Apr 54
Department of the Army, Procurement Section, Camp Kilmer, New Brunswick, New Jersey			
Installation of Air Conditioning in Theater No. 5, Bldg. 1071, at Camp Kilmer, N. J.	Job	(AI-28-022-54-41)	22 Apr 54
Fort McClellan, Office of the Purchasing and Contracting Officer, Fort McClellan, Alabama			
Installation of gas distribution system-services-and conversion of coal burning heating equipment to gas fired complete with all regulators, valves, controls.	Job	(01-088-54-16 B)	8 Apr 54
Base Procurement Division, EWMP, Building 120, Wright-Patterson AFB, Ohio			
Mechanical installation, in accordance with Exhibit "A" entitled, "Requirements for Altitude Chamber Accessories for Propeller Hub Altitude Test Facility."	1 ea.	(33-601-54-97B)	24 Jun 54
Officer in Charge, Navy Purchasing Office, Washington, D. C.			
Test chamber MK-4 med-o-specification, drawings LD284578.	208	7736-O-B	14 Apr 54

GENERAL SERVICES ADMINISTRATION

Description	Quantity	Reference No.	App. Bid Date
General Services Administration, Business Service Center, Region 5, 575 U. S. Courthouse, 219 S. Clark St., Chicago 4, Ill.			
Water coolers Fed. Spec. OO-C-566C.	372 ea.	CHN-603	16 Apr 54

CONTRACTS AWARDED THROUGH MARCH 30

Corps of Engineers, U. S. Army, Office of the District Engineer, New England Division, 857 Commonwealth Ave., Boston 15, Massachusetts

Construction of A.C. and Troop Supply Warehouse, Refrigerated Warehouse, Aircraft Shops, Portsmouth Air Force Base, Portsmouth, N. H. (ENG-19-016-54-65).—Job, $1,689,000.—Arthur Venneri Co., 300 North Ave., East Westfield, N. J.

Officer in Charge of Construction, Bureau of Yards and Docks Contracts, 9th Naval Dist., Bldg. 1-A, Great Lakes, Ill.

Central Heating Plant at the Naval Air Station, Lincoln, Neb. NOy-80369.—Job, $230,846.—Olson Construction Co., 410 S. 7th St., Lincoln 8, Neb.

Purchasing and Contracting Branch, Fort Campbell, Kentucky

Installation of Air Conditioning in Theater Buildings (SS-54-6). —Job, $93,350.—Engineering Contractors, Inc., 1395 Spring St., Atlanta, Ga.

1953 Philco Sales of $430,420,000 Set New Record; Net Earnings $13,068,000

PHILADELPHIA — Sales of Philco Corp. established a new record in 1953 of $430,420,000, an increase of $63,456,000 or 17% over 1952, William Balderston, president, and James T. Buckley, chairman of the board, announced in the company's annual report.

MAJOR DIVISIONS SHARED GAINS

Sales in 1952 were $366,964,000. The report said all major divisions of Philco shared in the sales gain.

"Net income from operations was $13,068,000 or $3.43 per share of common stock outstanding at Dec. 31 after payment of a special year-end 5% stock dividend," the report stated. "In addition, nonrecurring net income from the sale of Television Station WPTZ amounted, after taxes, to $5,283,000 or $1.43 per common share.

"Total earnings for the year were $18,351,000 or $4.86 per common share after payment of income and excess profits taxes, and dividends on preferred stock. Earnings for 1952 were $11,491,000 or $3.15 per common share on a lesser number of shares."

WORKING CAPITAL INCREASED

Philco's working capital was increased from $45,483,000 to $54,665,000 during 1953. This increase resulted from earnings over and above dividend payments and the profit from the sale of Television Station WPTZ.

Out of total net income of $18,351,000 last year, the report stated, $6,016,000 was paid out as dividends and the remaining $12,335,000 was reinvested in the business to increase working capital and to provide funds for plant expansion and equipment.

"Major expansion of production facilities to meet the demand for Philco products was undertaken during 1953," the report said. "Capital expenditures amounted to $7,446,000."

The report noted that a new plant for the production of refrigerators and home freezers is nearing completion at Connersville, Ind., and that in Canada, Philco is completing a new plant at Toronto for the manufacture of radios, television receivers, and electronic equipment.

The report also revealed that "after a careful study of future market potentialities for air conditioning," it was decided to devote a portion of the Connersville facilities to the production of room air conditioners.

With expanded production facilities, the report stated, "Philco will be better able to meet the enlarged demand for its air conditioning units."

The new Connersville plant will add 430,000 sq. ft. of floor space to the present manufacturing area, and production there will start in the second quarter of 1954, according to the report.

In commenting on Philco sales of major appliances in 1953, the report said the company had its "best year in the sales of refrigerators, home freezers, room air conditioners, and electric ranges."

Surface Combustion Corp. Consolidates Janitrol Departments In Columbus, Ohio

TOLEDO—Consolidation of sales and executive departments of the Janitrol divisions of Surface Combustion Corp. with manufacturing and engineering units in Columbus has been announced here by Frank H. Adams, president of the firm.

Executive, sales, advertising, and sales promotion activities will be located in the Columbus offices after April 1 in a move designed to streamline operations.

The Janitrol Heating & Air Conditioning Div. manufactures residential, commercial, and industrial space heating and cooling equipment at its Columbus plant, located at 400 Dublin Ave.

The company's Janitrol Aircraft-Automotive Div. manufactures gas turbine components and heating equipment for military and commercial aircraft, as well as for military ground vehicles. This divisions's research facilities are located at 400 Dublin Ave. The manufacturing plant is at 366-390 Mount Vernon Ave.

The company's Kathabar dehumidifying and air conditioning production facilities are located at 270 N. Fifth St. in Columbus. The engineering and sales departments of this activity will remain in Toledo.

Several Janitrol division executives are being transferred to Columbus in connection with the operational change. In all, more than 25 persons and their families will be involved in the move.

Heading up all Columbus operations, including Janitrol and allied functions, as general manager is Robin A. Bell. Bell, who joined Surface Combustion when the firm acquired the Columbus Gas Furnace Div. of the Columbus Heating & Ventilating Co. in 1930, attended the Engineering college of Ohio State university where he majored in architecture and was active in varsity football and basketball.

He has served in various engineering, sales, and management capacities for Surface Combustion in Rochester, N. Y. and Toledo.

Other newcomers to Columbus in connection with the Janitrol Heating & Air Conditioning Div. include Harry C. Gurney, sales manager; Charles C. Owen, assistant sales manager, Western Div.; Lawrence J. Monahan, assistant sales manager, Eastern Div.; Russell W. Glenn, sales administration manager; Edmund H. Lloyd, national representative, Air Conditioning.

Also Joseph A. Livi, credit manager; Ells Hilliard, advertising and sales promotion manager; George W. Williams, sales correspondence suppervisor; Albert J. Gleason, order department supervisor; Albert P. Marble, layout department supervisor; Paul Campbell, assistant secretary and treasurer; Richard E. Ireland, sales promotion supervisor; Mac L. Keeney, advertising production supervisor; Henry Altschul, returned materials; Fred Freeman and Carl Spilker, sales correspondence department; Jack Sayers, order department; and several secretaries and clerical personnel.

No changes in organization or personnel are being made in the production or engineering departments which have always been located in Columbus. Plant manager is Fred J. Potter, and engineering is managed by John I. Trimble.

Tenney Starts Operations At New Union, N.J. Plant

UNION, N. J. — Tenney Engineering, Inc. now is carrying on full-scale operations in its new plant at 1090 Springfield Rd. here.

The new plant consolidates and enlarges previous facilities of the old headquarters plant at 26 Ave. B, and an auxiliary plant at 68 Clifford St., both located in Newark, N. J.

The new plant will be devoted exclusively to the manufacture of environmental equipment. This equipment simulates climatic conditions—temperature, humidity, altitude, etc.

The current expansion marks the third in recent years. Originally located in Montclair, N. J., Tenney moved to the Ave. B address when the company outgrew its Montclair quarters. The Clifford St. space was required a short time later. In addition, the company leased storage space for raw materials.

The modern new Union plant is a one-story, 30,000-sq. ft. building. It will employ some 300 people and is situated on a 7-acre site to allow for future expansion. The plant has extra-high headroom to enable construction of large-size chambers and has extra-heavy structural members to support overhead cranes.

Monroe Seligman, president of Tenney, points out that the need for environmental equipment is expanding, not only for testing parts to be used by the military, but also for testing consumer items such as washing machines, fabrics, plastics, etc. In addition to being used in testing operations, low temperature equipment (to -170° F.) is used in manufacturing operations.

Tenney's Baltimore plant, which manufactures "low-side" refrigeration products—coils, unit coolers, ice makers, expansion valves, etc. —will not be affected by the move, according to the announcement.

Bush Declares 25-Cent Dividend

WEST HARTFORD, Conn.—The board of directors of the Bush Mfg. Co. here has declared a 25-cent dividend on common stock payable on April 1 to holders of record on March 22. At the same time the company will pay a 28⅛-cent dividend on the 4½% cumulative convertible prior preferred stock.

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other addresses by actual word count. Please send payment with order.

POSITIONS WANTED

ATTENTION MANUFACTURERS: Can offer top diagnosis of service problems with extensive experience in commercial refrigeration, electric motors and wiring. Have done custom application work. Fully experienced in administrative capacity. Excellent customer and employee relationship. Contemplating a change. Seeking responsible position. Willing to work. Age 38, married. Full resume, please write BOX 4539, Air Conditioning & Refrigeration News.

ATTENTION, MANUFACTURERS—Maybe you don't need a full-time writer for your instruction sheets and manuals. In that case, it will pay you to look into a new writing service offered by a practical refrigeration and air conditioning man who can handle clear "American" English. VIRGIL C. JAMES, Cuba, Missouri.

POSITIONS AVAILABLE

CARRIER DISTRIBUTOR needs man to contact dealers in half-state territory. Salary, car, expenses, bonus. Want person with ability to help dealers in self-contained application engineering, to deal on friendly basis with small town people who are our dealers, and yet is enough of a salesman to stir up enthusiasm and get orders. Write in full detail Fenton M. Dancy, CAHN ELECTRIC COMPANY, 708 Milam Street, Shreveport, Louisiana.

OPPORTUNITY FOR factory field man contacting distributors of food market equipment. Manufacturer of grocery and super market steel shelving has closed, exclusive territories available. Should have store lay-out and planning experience. Reply to C. R. LINGO ENGINEERING COMPANY, 220-230 Madison Avenue, Covington, Kentucky. Phone: AXtel 1101-1102.

TAMPA, FLORIDA, Carrier distributor wants aggressive, experienced man to develop dealers. Draw and commission. Also have opening for experienced air conditioning engineer. State age, experience, salary expected, and recent photo if possible. BOX 4540, Air Conditioning & Refrigeration News.

WANTED—OFFICE engineer by fast growing organization engaged in designing, installing and maintaining air conditioning, refrigeration, heating, and dust control systems. Duties—Sales estimating, lay-out work, materials control, office and shop supervision. Permanent position with salary and generous bonus. Inquire THE DIXON COMPANY, INC., 9 Center Place, Williamsport, Penna. Phone 3-3739.

EQUIPMENT FOR SALE

ATTENTION SERVICEMEN: Send for our refrigeration parts and supplies catalog. Save up to 50% on many items. Relays, V belts, T.X. valves, fittings, controls, driers. New—guaranteed merchandise. WALTER W. STARR REFRIGERATION, 2833 Lincoln Avenue, Chicago 13, Illinois.

FREEZER SHELF plates for sale: Large quantity of prominent brand serpentine steel plates about 22″ x 25″. Warehouse inventory at a fraction of manufacturer's cost. $3.75 each on lot FOB Storrs, Connecticut. GEORGE CROWTHER ASSOCIATED, Storrs, Connecticut.

NATIONAL BRAND butcher beam scales new in cartons, 650 lbs. capacity at 50% of cost, $19.95 each, 6 or more $17.95. Deposit required. Suitable for butchers, restaurants, hotel, grocers, fish markets, fruit markets, caterers. GENERAL REFRIGERATOR CO., 919 W. Girard Ave., Philadelphia 23, Penna.

BUSINESS OPPORTUNITIES

MANUFACTURERS' REPRESENTATIVES Wanted: Liberal discounts, immediate deliveries of "Dustronic"—new electronic room air filter for homes and offices. Product has proved good seller on regional basis—now ready for national distribution. Good year 'round seller, particularly strong during hay fever season. Write immediately to: RADEX CORPORATION, 2076 Elston Avenue, Chicago 14.

D. L. TAFT

W. G. SCHREIBER

McCray Names Schreiber General Service Manager

KENDALLVILLE, Ind. — Appointment of Walter G. Schreiber as general service manager for McCray Refrigerator Co., Inc. here to succeed Don L. Taft who has been transferred to the engineering department as assistant chief engineer, was announced recently by J. W. Bostwick, vice president in charge of sales.

For the past several years Schreiber has been district sales manager for the southeastern district with headquarters in Atlanta. He has been active in the McCray sales department for 25 years.

In his new assignment, he will coordinate the activities of field servicemen and office service personnel.

Airtemp Construction Corp. Opens St. Louis Office

DAYTON — Russell M. Hagan will head Airtemp Construction Corp.'s new St. Louis office, R. B. Stotz, manager of Airtemp Construction Corp., announced.

Hagan will be located in the Title Guaranty building, St. Louis. A field engineer, Hagan joined Chrysler Airtemp last January at Dayton. He formerly was affiliated with Condaire, Inc., and the L. V. Fleiter Co., St. Louis, as a sales engineer.

A native of St. Louis, he attended Washington university.

The Airtemp Construction Corp. is a subsidiary of Chrysler Corp.'s Airtemp Div., and cooperates with air conditioning dealers in handling major air conditioning projects that utilize central statio.. equipment.

Conrad Building New Plant To Expand Production

HOLLAND, Mich. — Charles Conrad, president of Conrad, Inc., announced recently that the firm has a new plant under construction here.

The building is a one-story cinder block construction of 6,000 sq. ft. and will expand the company's capacity for the manufacture of temperature, environmental, humidity, and altitude test chambers, and liquid chillers for laboratory and industrial processing.

JUST ASK US!

Turn to "What's New" Page for useful information on new products.

Price Cuts--

(Concluded from Page 1, Col. 2)

consumers because supporters of the measure had claimed it would be a stimulant to sales.

Even before President Eisenhower had signed the bill, such manufacturers as General Electric Co., Westinghouse, Philco, Crosley and Bendix divisions of Avco announced prices of their home appliances would be reduced amounts equivalent to the tax cut.

Manufacturers of clothes dryers and ironers were to reduce their prices April 1, according to the America Home Laundry Manufacturers Association.

Kelvinator has wired new suggested list prices on its appliances affected by the tax reduction. The company has announced price reductions on the following refrigerators, effective April 1:

Model No.	Old	New
VHD-71	$249.95	$239.30
VKD-95	299.95	287.30
KAD-90	359.95	344.75
MAD-110	419.95	402.30
NTD-120	529.95	507.50

Hotpoint Co. announced it would reduce recommended retail prices of its appliances by $9 to $25, effective April 1, to reflect the full excise tax reduction.

Deepfreeze Div. of Motor Products Corp. has recommended that its distributors and dealers immediately lower prices on the appliances affected.

Admiral Corp. said the excise tax cuts would be passed on to consumers.

In addition to passing along the full benefits of the tax cuts to its consumers, Sears Roebuck & Co. has also announced additional price reductions on 11 refrigerator models. Prices have been reduced $10 on eight models and about $20 on three higher-priced refrigerators, in addition to the selling price reduction resulting from the tax cut.

Tax Refund--

(Concluded from Page 1, Col. 4)

The refund amendment states that manufacturers will be refunded or credited with half the tax paid under the previous rate if the manufacturer has reimbursed the "dealer" in like amount. As used in the amendment, the word "dealer" includes distributors and retailers.

Manufacturers will have until Aug. 1, 1954, to file claim for refunds or credit.

The matter is complicated by the fact that the excise tax is "buried" in the suggested list price of most appliances. It was 10% of the manufacturer's sale price to distributors. As a result of the conventional markup system, the excise tax is also marked up.

When the tax is cut, the markup system reduces the list price more than the actual reduction in tax.

For example, a manufacturer paid an excise tax (10%) of approximately $15 on a refrigerator which carried a suggested list price of $300. Under the new law (5%) he would pay approximately $7.50 excise tax. However, the suggested list price under the new law has been cut some $12.

Presumably the manufacturer would receive, in this case, a refund of $7.50 from the government. The excise tax, however, cost the retailer $12, apparently, under the 10% tax, judging by the new suggested list price.

Is the dealer, then, to expect a refund of $12 instead of $7.50?

The same problem is faced by the wholesaler.

The new tax law is also interpreted as providing a refund for the consumer who is making instalment payments on appliances covered even though the purchase was made before April 1. Refund or reduction would apply only to payments made after April 1.

Strip Inactive Mfrs. Of Fair-Trading Privileges, NRFA Asks

WASHINGTON, D. C. — Manufacturers who fail to enforce their fair-trade prices should be deprived of the "privilege" of fair trading.

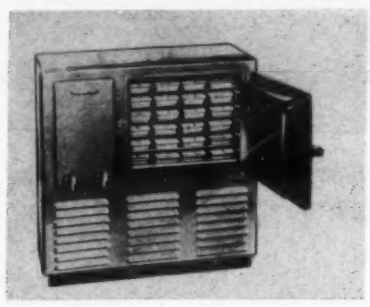
So suggests the National Retail Furniture Association in its new program to battle unfair trade practices. The association urges members and other associations to seek amendments to this effect in their state fair-trade laws.

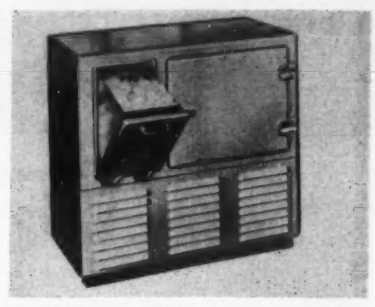
Julian W. Caplan, director of NRFA's local office, asserted that fair-trading manufacturers, wholesalers, and distributors must "be infused with the realization of their responsibilities."

He added that such an amendment to the fair-trade laws would let law-abiding merchants "know where they stand and when they can meet competitive fire with fire."

Knoxville Store Opens

KNOXVILLE, Tenn.—Featuring a complete line of General Electric appliances, Everett Appliance Store has opened at 517 Market St. H. H. Everett, proprietor, was for 13 years associated with the appliance business in one of Knoxville's leading department stores.





Fogel 'Rapid Freeze' ice cuber shown above has a capacity of 48 lbs. of cubes every three hours. Picture on left shows freezer door open; on right is same model with storage bin open.

Fogel Introduces New Ice Maker Models--

(Concluded from Page 1, Col. 3)

without interrupting the freezing process."

According to the manufacturer, the cost per freezing using this unit is approximately five cents. On this basis, it is claimed that the initial cost of the machine can be recouped within a few months from the difference between the nickel per bushel and the commercial cost of ice cubes.

The unit comes with a ⅓-hp. hermetically-sealed condensing unit. Where extra-fast freezing is desired, the 24-tray cube maker is also available in a ½-hp. model (2 MCI).

No plumbing or installation is necessary. There is an accessible drain for cleaning and defrosting.

The ice cube maker has been designed to align with underbar fixtures without extending into the aisle, the company pointed out.

Construction is of welded steel. Standard finish is silver hammertone, with other finishes available on special order.

A smaller model (16 MCI) is also available which freezes 256 cubes every 2½ hours. This unit, which also aligns with underbar fixtures, is designed for use where space is limited.

In this model the storage drawer is located underneath the freezing area and is accessible through the same door as the freezing trays. It is powered by a ¼-hp. hermetically-sealed condensing unit.

Cyrus Shank Moves

CHICAGO—Frank Krupp of the Cyrus Shank Co., manufacturer of refrigeration valves, announces that the company is moving to larger space at 4646 W. 12th Place, Chicago, 50.